Vol. 1085 Number 2

OFFICIAL GAZETTE

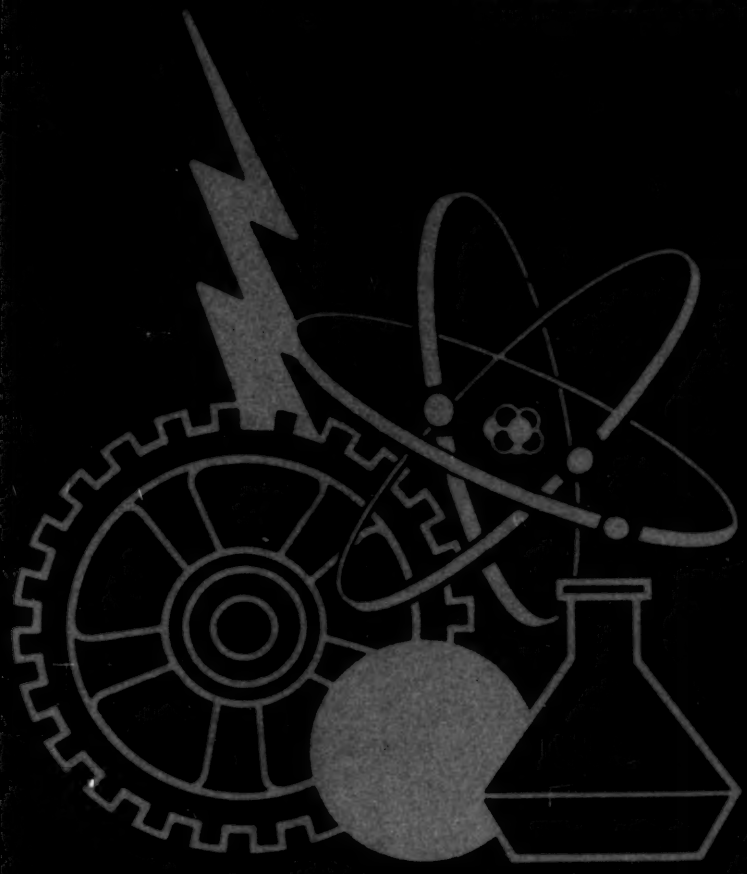
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

December 8, 1987



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
December 8, 1987 Volume 1085 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on December 4, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,485,489 through 4,486,900
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 20, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,404,689	06/219,138	9/20/83
4,404,695	06/330,682	9/20/83
4,404,699	06/294,389	9/20/83
4,404,700	06/342,713	9/20/83
4,404,701	06/341,531	9/20/83
4,404,705	06/250,610	9/20/83
4,404,711	06/294,003	9/20/83
4,404,716	06/405,993	9/20/83
4,404,734	06/404,239	9/20/83
4,404,742	06/281,039	9/20/83
4,404,751	06/358,840	9/20/83
4,404,752	06/270,083	9/20/83
4,404,753	06/330,966	9/20/83
4,404,757	06/263,256	9/20/83
4,404,761	06/280,747	9/20/83
4,404,762	06/346,506	9/20/83
4,404,764	06/291,114	9/20/83
4,404,766	06/262,902	9/20/83
4,404,788	06/241,347	9/20/83
4,404,809	06/401,374	9/20/83
4,404,817	06/352,184	9/20/83
4,404,818	06/417,993	9/20/83
4,404,819	06/398,745	9/20/83
4,404,822	06/265,041	9/20/83
4,404,824	06/231,777	9/20/83
4,404,826	06/269,839	9/20/83
4,404,832	06/348,034	9/20/83
4,404,833	06/305,632	9/20/83
4,404,835	06/304,327	9/20/83
4,404,839	06/232,366	9/20/83
4,404,840	06/264,687	9/20/83
4,404,842	06/368,538	9/20/83
4,404,857	06/303,215	9/20/83
4,404,868	06/385,074	9/20/83
4,404,878	06/247,576	9/20/83
4,404,879	06/357,021	9/20/83
4,404,881	06/294,326	9/20/83
4,404,883	06/226,117	9/20/83
4,404,884	06/247,798	9/20/83
4,404,888	06/310,944	9/20/83
4,404,889	06/297,295	9/20/83
4,404,902	06/396,480	9/20/83
4,404,903	06/346,661	9/20/83
4,404,904	06/332,638	9/20/83
4,404,914	06/294,669	9/20/83
4,404,935	06/257,666	9/20/83
4,404,937	06/328,676	9/20/83
4,404,944	06/290,078	9/20/83
4,404,945	06/290,076	9/20/83
4,404,951	06/422,845	9/20/83
4,404,953	06/260,092	9/20/83
4,404,955	06/294,614	9/20/83
4,404,959	06/345,167	9/20/83
4,404,966	06/286,574	9/20/83
4,404,973	06/255,895	9/20/83
4,404,974	06/291,023	9/20/83
4,404,979	06/300,647	9/20/83
4,404,981	06/348,849	9/20/83
4,404,988	06/331,213	9/20/83
4,404,994	06/343,052	9/20/83
4,404,995	06/252,859	9/20/83
4,405,012	06/267,003	9/20/83
4,405,014	06/353,111	9/20/83
4,405,019	06/299,358	9/20/83
4,405,022	06/310,548	9/20/83
4,405,025	06/302,623	9/20/83
4,405,034	06/334,130	9/20/83
4,405,041	06/283,873	9/20/83
4,405,043	06/272,902	9/20/83
4,405,048	06/352,242	9/20/83
4,405,049	06/310,799	9/20/83
4,405,059	06/281,671	9/20/83
4,405,061	06/335,244	9/20/83
4,405,064	06/266,747	9/20/83
4,405,087	06/283,896	9/20/83
4,405,091	06/255,849	9/20/83
4,405,098	06/267,560	9/20/83
4,405,099	06/261,261	9/20/83
4,405,100	06/236,480	9/20/83
4,405,107	06/391,176	9/20/83
4,405,108	06/257,905	9/20/83
4,405,114	06/268,157	9/20/83
4,405,117	06/305,973	9/20/83
4,405,118	06/341,506	9/20/83
4,405,119	06/285,790	9/20/83
4,405,120	06/270,971	9/20/83

Patent Number	Serial Number	Issue Date
4,405,131	06/305,479	9/20/83
4,405,133	06/428,136	9/20/83
4,405,148	06/284,547	9/20/83
4,405,152	06/285,702	9/20/83
4,405,157	06/354,452	9/20/83
4,405,158	06/266,643	9/20/83
4,405,165	06/246,241	9/20/83
4,405,175	06/313,134	9/20/83
4,405,184	06/243,684	9/20/83
4,405,187	06/246,248	9/20/83
4,405,200	06/228,239	9/20/83
4,405,202	06/248,695	9/20/83
4,405,204	06/242,762	9/20/83
4,405,217	06/298,388	9/20/83
4,405,240	06/249,716	9/20/83
4,405,244	06/285,503	9/20/83
4,405,248	06/312,154	9/20/83
4,405,249	06/245,606	9/20/83
4,405,250	06/296,149	9/20/83
4,405,254	06/272,512	9/20/83
4,405,256	06/254,324	9/20/83
4,405,258	06/347,930	9/20/83
4,405,269	06/314,171	9/20/83
4,405,270	06/293,674	9/20/83
4,405,276	06/272,205	9/20/83
4,405,278	06/306,293	9/20/83
4,405,279	06/293,842	9/20/83
4,405,294	06/293,976	9/20/83
4,405,318	06/248,512	9/20/83
4,405,326	06/269,360	9/20/83
4,405,328	06/296,569	9/20/83
4,405,329	06/268,978	9/20/83
4,405,337	06/378,814	9/20/83
4,405,338	06/345,878	9/20/83
4,405,340	06/272,429	9/20/83
4,405,348	06/297,179	9/20/83
4,405,356	06/298,057	9/20/83
4,405,365	06/412,552	9/20/83
4,405,366	06/276,837	9/20/83
4,405,368	06/261,626	9/20/83
4,405,384	06/431,110	9/20/83
4,405,407	06/250,154	9/20/83
4,405,412	06/362,589	9/20/83
4,405,417	06/458,428	9/20/83
4,405,423	06/299,233	9/20/83
4,405,453	06/351,384	9/20/83
4,405,454	06/259,097	9/20/83
4,405,461	06/362,225	9/20/83
4,405,469	06/286,798	9/20/83
4,405,487	06/373,076	9/20/83
4,405,510	06/362,239	9/20/83
4,405,538	06/291,315	9/20/83
4,405,541	06/316,314	9/20/83
4,405,543	06/417,516	9/20/83
4,405,555	06/279,011	9/20/83
4,405,564	06/439,318	9/20/83
4,405,565	06/439,319	9/20/83
4,405,573	06/331,949	9/20/83
4,405,605	06/286,693	9/20/83
4,405,608	06/296,839	9/20/83
4,405,610	06/247,375	9/20/83
4,405,613	06/401,305	9/20/83
4,405,619	06/298,789	9/20/83
4,405,623	06/263,898	9/20/83
4,405,634	06/232,731	9/20/83
4,405,637	06/306,535	9/20/83
4,405,639	06/374,370	9/20/83
4,405,644	06/331,712	9/20/83
4,405,646	06/396,260	9/20/83
4,405,670	06/383,264	9/20/83
4,405,707	06/284,099	9/20/83
4,405,710	06/276,115	9/20/83
4,405,732	06/358,087	9/20/83
4,405,738	06/354,981	9/20/83
4,405,744	06/265,570	9/20/83
4,405,759	06/365,438	9/20/83
4,405,765	06/413,084	9/20/83
4,405,779	06/281,699	9/20/83
4,405,795	06/385,522	9/20/83
4,405,796	06/355,649	9/20/83
4,405,797	06/312,035	9/20/83
4,405,800	06/360,312	9/20/83
4,405,801	06/391,657	9/20/83
4,405,802	06/350,854	9/20/83
4,405,813	06/318,116	9/20/83
4,405,814	06/290,622	9/20/83
4,405,815	06/325,812	9/20/83
4,405,824	06/347,727	9/20/83
4,405,849	06/355,511	9/20/83
4,405,856	06/439,297	9/20/83
4,405,861	06/294,674	9/20/83
4,405,873	06/314,617	9/20/83
4,405,880	06/272,610	9/20/83
4,405,893	06/280,205	9/20/83
4,405,905	06/224,133	9/20/83
4,405,908	06/255,161	9/20/83
4,405,924	06/245,208	9/20/83
4,405,927	06/266,771	9/20/83
4,405,941	06/219,801	9/20/83
4,405,950	06/264,211	9/20/83
4,405,957	06/265,622	9/20/83
4,405,969	06/307,843	9/20/83
4,405,984	06/230,398	9/20/83
4,405,991	06/251,754	9/20/83
4,406,006	06/389,914	9/20/83
4,406,018	06/291,181	9/20/83

Notification of Acceptance of Delayed Payment of Maintenance Fee
(35 U.S.C. 41(c); 37 CFR 1.378)

The patents listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,357,296	06/228,276	11/02/82	1/26/81	11/03/87
4,365,378	06/240,994	12/28/82	3/05/81	11/03/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,550,516, Re. S.N. 114,233, Filed Oct. 29, 1987, Cl. 40/513, PICTURE VIEWER, Peter Ackeret, Owner of Record: *Licinvest AG, Chur, Switzerland,* Attorney or Agent: Charles B. Smith, et al., Ex. Gp.: 333

4,598,605, Re. S.N. 111,417, Filed Oct. 19, 1987, Cl. 74/501M, MECHANISM WITH TORQUE-LIMITING DEVICE FOR CONTROLLING A REARVIEW-MIRROR, Stephane Manzoni, Owner of Record: *Manzoni Bouchot, Saint-Claude, France,* Attorney or Agent: Remy J. Vanophem, et al., Ex. Gp.: 358

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 31,873, Reexam. No. 90/001,368, Requested: Nov. 4, 1987, Cl. 128/674, VENOUS CATHETER DEVICE, Randolph M. Howes, Owner of Record: *Randolph M. Howes & Janice Kinchen, Picayune, Miss. & Hammond, La.,* Attorney or Agent: Richard H. Smith, Ex. Gp.: 330, Requester: Hayes, Davis, et al., Manchester, N.H.

4,349,087, Reexam. No. 90/001,365, Requested: Nov. 2, 1987, Cl. 250/561, LEAD SENSING SYSTEM, Robert J. Duncan, et al., Owner of Record: *USM Corp., Farmington, Conn.,* Attorney or Agent: Arthur B. Moore, Ex. Gp.: 250, Requester: Universal Instruments Corp., Binghamton, N.Y.

4,564,313, Reexam. No. 90/001,366, Requested: Oct. 30, 1987, Cl. 405/125, RECTILINEAR CULVERT STRUCTURE, Robert L. Niswander, et al., Owner of Record: *Highway Concrete Pipe Co., Inc., Findlay, Ohio,* Attorney or Agent: David D. Murray, Ex. Gp.: 350, Requester: Owner

4,647,994, Reexam. No. 90/001,369, Requested: Nov. 2, 1987, Cl. 360/85, MINIATURIZED CARTRIDGE-TYPE DRIVE FOR DATA PROCESSORS, Samuel N. Irwin, et al., Owner of Record: *Irwin Magnetic Systems, Inc., Ann Arbor, Mich.,* Attorney or Agent: William W. Dewitt, Ex. Gp.: 230, Requester: Townsend & Townsend, San Francisco, Calif.

4,677,481, Reexam. No. 90/001,367, Requested: Nov. 2, 1987, Cl. 358/139, DUAL DISPLAY MONITOR, Dan H. Nicholas, Owner of Record: *Tektronix, Inc., Beaverton, Ore.,* Attorney or Agent: Francis I. Gray, Ex. Gp.: 260, Requester: Owner

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Erratum

"All reference to Reexam No. B1-4,189,879 (516th) to Zenshiro Uehara of Japan, for 'CONTROLLABLE DRIVE FOR A TAPE RECORDER', appearing in the Official Gazette of June 10, 1986, should be deleted since no Reexamination Certificate was granted."

Department of Commerce
Patent and Trademark Office
37 CFR Part 1 [Docket No. 71008-7208]

Variety Denomination Requirements for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: The Patent and Trademark Office proposes to amend certain of the rules of practice applicable to the patenting of plants. Under the proposed rules of practice, an applicant for such a patent would, in addition to any requirements for obtaining a patent, also be required to record an identifying variety denomination for the plant. These proposed rules fulfill an obligation imposed by the Convention of the International Union for the Protection of New Plant Varieties (the UPOV Convention), to which the United States adheres.
Dates: Comments on the proposed rules must be submitted by Jan. 8, 1988, to assure their consideration in formulating the rules put into effect. A public hearing will be held on Jan. 15, 1988, beginning at 9:30 A.M., in the Commissioner's Conference Room, Crystal Plz. 3, the Patent and Trademark Office.
Addresses: Address comments to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231. All comments received will be publicly available in the Patent and Trademark Office, Crystal Plz. 3, Arlington, Va., Rm. 11C28.
For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557-3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: The UPOV Convention became applicable to the United States on Nov. 8, 1981, as a consequence of the President's exercise of authority to adhere to this international agreement. Under Articles 6 and 13 of the UPOV Convention, each plant variety for which protection is sought must be given a variety denomination and that denomination recorded ("registered" in the language of the Convention) at least by the time the patent is granted. It is left to each of the UPOV member states to determine how recordation is effected. For the United States, the issuance of a patent which includes the denomination of the variety would constitute recordation and registration for the purposes of compliance with UPOV Convention. The patent examining process would include consideration of the suitability for recordation of the proposed variety denomination.

Attention is called to two earlier Commissioner's Notices on this subject. The Notice of Oct. 20, 1981 (46 FR 51426) stated that appropriate rules for the registration of variety denominations, as required by the UPOV Convention, would be issued. The Commissioner's Notice, published in the Federal Register on Aug. 16, 1985, 50 FR 33062, proposed amendments to the Patent and Trademark Office's rules of practice to carry out this requirement. In light of public comments received, the earlier proposed rules are being withdrawn from consideration and replaced by these revised proposed rules. These would apply to plants patented under either 35 U.S.C. 101 or 161, but would not apply to any protection sought under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), administered by the United States Department of Agriculture.

These proposed rules, in accordance with the patent law requirements for providing a descriptive title for a patent application, would require the variety denomination proposed for recordation to be included in the title of the application. The denomination would be judged for recordability by the examiner assigned the application for examination, who would consult with appropriate trademark examination officials to determine if there exists a possibly conflicting trademark registration or application for registration.

The recordation of a variety denomination for purposes of compliance with UPOV Convention Article 13 is not to be understood as conveying any legal rights in that denomination. Recordation does no more than establish a prima facie case that can be asserted as evidence of the possible generic nature of the variety denomination, if genericness is not already established by its usage in the commercial market, advertising or publication.

Under the proposed rules, the Patent and Trademark Office in examining the recordability of variety denominations will, in addition to its trademark records, utilize the Office's compilation of denominations obtained from horticultural, agricultural, floral and other professional

societies, national breeders' rights offices, the UPOV Union's Secretariat, standard references and other available sources. Article 13 of the UPOV Convention requires that the variety denomination must enable the plant variety to be identified, that the denomination not consist solely of numbers except if this is shown to be an established practice for designating plant varieties, and that the denomination not be liable to mislead or cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. No specific naming system is required by the Article. While a portion of the consuming public and others might prefer plant variety names conforming to the International Code of Nomenclature for Cultivated Plants or the UPOV Guidelines, common usage, code systems or other ways of identifying plants cannot be ignored.

The Patent and Trademark Office would accept for recordation a variety denomination complying with the requirements of the UPOV Convention's Articles 13(2) and 13(4). A number of variety denomination systems currently in use, such as the system described in the 1980 revision of the International Code of Nomenclature for Cultivated Plants, the UPOV Guidelines and various code systems may also meet these requirements. Sexually reproduced varieties could be named in compliance with the requirements of the Federal Seed Act.

In the event the examiner does not approve a proposed variety denomination for recordation, the applicant could petition the Commissioner for approval. Thus, the examination and approval of variety denominations will be handled in the same way as other procedural and administrative requirements not relating to the merits of the invention, such as the requirement to provide an abstract of the disclosure or the requirement to provide a title. A final refusal by the Commissioner on petition would require submission of another proposed denomination for recordation.

The petition to the Commissioner will be subject to a fee and the other requirements relating to petitions. The Commissioner may in appropriate cases delegate to the Assistant Commissioner for Trademarks or other appropriate trademark officials the decision of such petitions, under 37 C.F.R. 1.181(g).

The UPOV Convention requires the applicant to identify the patented variety by the same variety denomination (or a translation thereof) in all UPOV member states. A different denomination may be recorded in a particular member state, however, in cases where the denomination registered in another member state is unsuitable for business or other reasons. An applicant may during the course of examination be required to inform the Office of any other denomination by which the variety is known.

While these rules provide for the recordation of variety denominations, they recognize at the same time that, in cases of conflict, previously established proprietary rights are paramount. Recordation is in legal effect, therefore, no more than publication of a denomination which is or may become the generic name of a plant variety.

Trademark owners, owners of other proprietary rights and patent applicants share a common interest in knowing as early as possible if a variety denomination proposed for recordation possibly conflicts with a trademark or other proprietary rights. Accordingly, each denomination proposed for recordation, along with the genus and species to which the variety belongs, shall be published in the Official Gazette as soon as reasonably possible after receipt of the application in the Office. The Commissioner has determined that publication of such information constitutes special circumstances under 35 U.S.C. 122.

The public may provide information to the Office concerning the recordability of a proposed denomination. Such information would be entered in the official file wrapper of the application and be available to the examiner. Such information shall be called to the attention of the applicant by the Office.

Also, the *Official Gazette* would list newly recorded denominations in United States patents in order for trademark owners to assert their rights in appropriate cases through private negotiations or judicially, as they may now do in trademark cases. Proceedings in the Office in regard to the registration of variety denominations, however, will be conducted ex parte.

Under the proposed rules, each applicant would be required to specify in an application for protection of a plant variety the date of first use of the denomination if used prior to filing of the patent application, or later to provide information about the date of first commercial use during pendency of the application. In cases of conflict between a trademark and a proposed variety denomination, the variety denomination will not be accepted for recordation unless its first commercial use clearly antedates another's established rights.

If a patentee learns of a conflict between a trademark and the recorded variety denomination after issuance of the patent, the patentee in order to resolve the conflict will be permitted to record a different denomination by means of the Certificate of Correction procedure. Also, a variety denomination found after issuance of a patent to be commercially unsuitable or ill-advised could be changed in a similar manner.

The Office now permits plants and plant varieties to be patented both specifically and broadly under patent 35 U.S.C. 101. In some cases, however, claims in an application will not be limited to a specific variety. These proposed rules would apply only to applications where a specific variety or varieties are claimed. Only these need be identified by a variety denomination, except where the number of varieties involved makes this impractical. In such a case, each claim directed to a specific variety would include its variety denomination, but these variety denominations could be omitted from the title of the patent. Variety denominations would not be required for microorganisms or microscopic plant parts.

Other Considerations: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This rule contains a collection of information requirement subject to the Paperwork Reduction Act. This colletion of information requirement has been cleared by OMB under control No. 0651-0011.

The General Counsel of the Department Commerce has certified to the Small Business Administration that the proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The variety denomination requirement will not impose extra work on patent applicants (whether small or large businesses or individuals). The rules will help avoid burdensome and expensive litigation over trademark rights.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out in the preamble, 37 CFR Part I is proposed to be amended by revising §§1.72, and 1.17 and adding a new §1.168 as set forth below. All proposed additions are printed between arrows.

PART I - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is proposed to be amended by adding the following items in numerical order to the list in paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) * * *

► §1.168(d) For petitioning the Commissioner to record a plant variety denomination . . .
§1.168(g) For petitioning the Commissioner to record a substitute plant variety denomination . . . ◄

3. Section 1.72 is proposed to be amended by adding the following paragraph:

§1.72 Title and abstract.

* * *

► (c) In the case of an application for the patenting of a plant variety under the provisions of 35 U.S.C. 101 or 161, the title of the application must include a variety denomination for the specific new variety claimed, except as provided for in §1.168(b). The granting of the patent will be deemed the recordation of the variety denomination for purposes of compliance with Article 13 of the International Convention for the Protection of New Varieties of Plants, as revised on Oct. 23, 1978.

4. A new §1.168 is proposed to be added, to read as follows:

► §1.168 Variety denomination, submission to the Office, examination.
(a) The variety denomination submitted by the patent applicant under §1.72 will be examined for compliance with the International Convention for the Protection of New Varieties of Plants. Specifically, the denomination:

(1) must enable the plant variety to be identified;
(2) must not be likely to cause confusion, to cause mistake or to deceive concerning the characteristics, value or identity of the plant variety or the identity of the breeder ;
(3) must not consist solely of numbers except if this is an established practice for designating plant varieties; and
(4) must not be likely to cause confusion or mistake or to deceive as to any prior right of a third party, and shall not affect prior rights of third parties.

(b) If a proposed variety denomination is not included as part of the title of the application, when filed, the examiner shall set a period of not less than thirty days to provide a variety denomination. If a plurality of plant varieties are claimed, which make it impractical to include each variety denomination in the title of the application, each claim directed to a specific plant variety shall instead include the denomination of the claimed plant variety. In cases where no specific plant variety is claimed, for example, a patent directed to the improvement of a plant species, the denomination requirement applicable to the patenting of a plant variety or varieties will be waived.

(c) If the examiner determines that a proposed variety denomination is not suitable for recordation, the examiner shall refuse recordation thereof and shall set forth in an Office action the reasons for such refusal. An applicant disagreeing with the reasons for such refusal may request reconsideration and withdrawal of the refusal, giving the reasons therefor. If the examiner's refusal to record a proposed variety denomination is repeated and made final, the examiner shall at the same time require the applicant to propose another variety denomination for recordation.
(d) After a final requirement by the examiner for submission of a proposed new variety denomination, the applicant, in addition to making any response due on the remainder of the action, may in lieu of proposing another variety denomination petition the Commissioner for review of the examiner's holding, upon payment of the fee set forth in §1.17(h).
(e) The applicant is required to submit for recordation the same variety denomination (or, if not in English, a translation or transliteration thereof) as that previously registered or recorded, or proposed for registration in an earlier filed application for protection of the same variety in another member state of the International Union for the Protection of New Varieties of Plants. The applicant may submit another denomination for recordation, however, upon a showing satisfactory to the examiner as to why the denomination originally submitted or registered in another member state of the said Union is unsuitable for recordation in the United States. During pendency of an application, the examiner may require the applicant to provide information regarding all denominations for the same variety registered or proposed for registration in other member states of the said Union before the application was filed in the United States.
(f) The applicant shall indicate in the application the date of first commercial use in the United States if any, of the variety denomination proposed for recordation; or, if not commercially used prior to filing of the application, indicate during pendency of the application when the denomination has first been commercially used in this country. No variety denomination will be recorded if first commercially used after the establishment of third party proprietary rights to the denomination.
(g) A patentee in order to avoid a conflict between a recorded variety denomination and a trademark or other proprietary right, or where the recorded variety denomination is likely to be confused with another, or where business or marketing considerations dictate, may propose for recordation a substitute variety denomination for that already recorded. Such a proposal shall be in the form of a petition to the Commissioner together with the fee set forth in §1.17(h). The proposed substitute denomination will be examined in the same manner as the denomination originally recorded, and upon recordation shall be promptly published in the *Official Gazette*. A Certificate of Correction indicating such substitute denomination shall be issued for the patent. If the patent has been assigned, only the assignee of record may apply for recordation of a substitute denomination.
(h) The Commissioner shall upon its receipt in the Office promptly publish in the *Official Gazette* each variety denomination proposed for recordation and the genus and species of the plant involved. Correspondence from the pub-

lic objecting to the recordation of such denomination, if accompanied by reasons therefor, will be placed in the official file and considered by the examiner in an ex parte manner. An objection to recordation may be based on an earlier recorded or unrecorded variety denomination, a registered or common law trademark, a trade name or trade indicia, or other alleged prior right timely called to the Office's attention. The applicant shall be notified by the Office of the receipt of such correspondence. The secrecy of any pending application will be preserved in accordance with 35 U.S.C. 122.◄

RENE TEGTMEYER,
Sept. 18, 1987. *Assistant Commissioner for Patents.*

Patents Available for License or Sale

4,457,504. THE COLLAPSIBLE/KNOCKDOWN SAWBUCK, *Gilbert E. Mottla*, 173 Mill Ln., Amherst, Mass. 01002.

4,587,746. ALVIN WILLIAMS SOLE AND HEEL SHOE TAP, *Evelyn M. Sommer*, 360 Lexington Ave., New York, N.Y. 10017.

4,677,278. FOOD VENDING MACHINE, *Hans Knoll, J. Nissen McAulay, Fields, Fisher, Goldstein & Nissen*, 405 Lexington Ave., New York, N.Y. 10174.

4,684,479. SURFACTANT MIXTURES, STABLE GAS-IN-LIQUID EMULSIONS, AND METHODS FOR THE PRODUCTION OF SUCH EMULSIONS FROM SAID MIXTURES, *J. S. D'Arrigo*, Cav-Con, 1622-3 Farmington Ave., Unionville, Conn. 06085.

4,689,001. BAT FOR POTTERS WHEEL, *Sherman Levy*, Suite 739 Investment Bldg., 1511 K St., N.W., Washington, D.C. 20005.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 8, 1987

Re. 32,412	4,641,110	4,669,431	4,678,329
Re. 32,468	4,642,869	4,670,482	4,678,637
D. 289,897	4,644,587	4,670,608	4,678,681
3,987,684	4,644,618	4,670,811	4,678,762
4,442,245	4,644,938	4,671,999	4,678,817
4,452,818	4,645,756	4,672,619	4,679,247
4,481,081	4,646,330	4,673,401	4,680,042
4,486,741	4,646,762	4,673,520	4,680,825
4,492,234	4,648,656	4,673,686	4,681,302
4,494,828	4,650,130	4,673,869	4,681,327
4,505,689	4,653,563	4,674,020	4,681,883
4,508,545	4,654,787	4,674,051	4,682,002
4,515,073	4,656,720	4,674,273	4,682,084
4,516,745	4,656,730	4,674,336	4,682,184
4,521,723	4,657,047	4,674,691	4,682,456
4,534,266	4,659,255	4,674,728	4,682,810
4,567,910	4,659,751	4,675,246	4,682,817
4,591,762	4,661,259	4,676,174	4,683,624
4,596,689	4,661,678	4,676,259	4,684,059
4,597,436	4,662,192	4,676,331	4,684,262
4,600,368	4,662,560	4,676,486	4,684,479
4,605,696	4,662,827	4,676,598	4,684,920
4,609,391	4,663,431	4,676,729	4,684,998
4,613,032	4,663,445	4,676,992	4,685,118
4,613,491	4,663,491	4,677,128	4,685,362
4,616,528	4,664,779	4,677,172	4,685,463
4,616,607	4,665,071	4,677,386	4,685,793
4,622,107	4,665,267	4,677,418	4,685,854
4,623,173	4,665,298	4,677,535	4,685,965
4,624,966	4,665,418	4,677,540	4,686,191
4,626,179	4,666,473	4,677,590	4,687,018
4,632,689	4,667,323	4,677,741	4,687,532
4,633,161	4,667,741	4,677,931	4,687,737
4,635,592	4,667,806	4,678,123	4,689,967
4,639,165	4,668,972	4,678,151	4,694,737

Disclaimers

4,433,446.—*Ronald N. Grimstad*, Sheboygan, Wis. FLUSH VALVE ATTACHMENT SYSTEM. Patent dated Feb. 28, 1984. Disclaimer filed Oct. 2, 1987, by the assignee, *Kohler Co.*

Hereby enters this disclaimer to claims 1–3 and 5–9 of said patent.

4,625,947.—*Stephen A. Denman*, Centerville and *Garthwood R. Taylor*, Dayton, Ohio. TIRE LIFT/CARRIER. Patent dated Dec. 2, 1986. Disclaimer filed Sept. 17, 1987, by the assignee, *Deuer Manufacturing Inc.*

The term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

4,681,428.—*James M. Devoy*, Rochester, N.Y. APPARATUS FOR PRODUCING INTERLEAVED COPY SHEETS. Patent dated July 21, 1987. Disclaimer filed Oct. 6, 1987, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimer and Dedication

4,658,548.—*John T. Gerritsen*, Hanover Park, Ill. WEATHERSTRIP MEMBER WITH FLOATING INTERIOR BULB. Patent dated Apr. 21, 1987. Disclaimer and Dedication filed Oct. 7, 1987, by the assignee, *Jarrow Products, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks (e.g. amendments to applications and request for extensions of time to file an opposition). Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and any subsequently filed papers for those applications.
Box 8	All papers for the Office of the Solicitor.
Box 9	Coupon orders for the U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
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Box FWC	Mail related to File Wrapper and Continuations.
Box Interference	Communications relating to interferences and applications and patents involved in interferences.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination application.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 24, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-11-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-05-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-24-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	9-06-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-02-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-06-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,531,806 to 3,537,106, inclusive

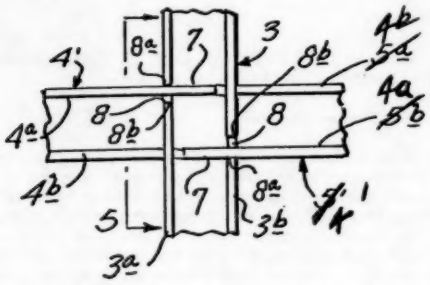
Plant Patents ..... Numbers 2,991 to 2,995 inclusive

REEXAMINATIONS

DECEMBER 8, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicate additions made by reexamination.

B1 4,034,534 (787th)
LOUVERED CEILING
John L. Taylor, Jagerslaan, Netherlands, assignor to Intalite International, Willemstaad, Netherlands Antilles
Reexamination Request No. 90/001,130, Nov. 21, 1986.
Reexamination Certificate for Patent No. 4,034,534, issued Jul. 12, 1977, Ser. No. 649,724, Jan. 16, 1976.
Continuation-in-part of Ser. No. 462,423, Apr. 19, 1974, abandoned.
Claims priority, application Canada, Apr. 30, 1973, 169893
Int. Cl.[4] E04C *2/47*
U.S. Cl. 52—668



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

1. A light transmitting, louvered ceiling assembly comprising:

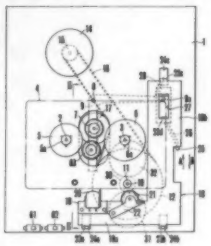
a. at least one runner of upwardly open channel section, comprising a first side-wall, a second side-wall and a base wall joining said side-walls;

b. a louver comprising first and second sections, adapted to be supported on said runner, each of said first and second sections comprising at least one upwardly open channel member having a third side-wall, a fourth side-wall and a base wall joining said side-walls;

c. a downwardly extending slot disposed in each of said first and second side-walls of said runner, each of said slots having widened upper portion, a narrowed lower portion and a substantially vertical edge, the vertical edges of the slots in said first and second side-walls being offset from each other by a distance substantially equal to the spacing between said third and fourth side-walls;

d. each of said third side-walls comprising a downwardly extending hook-shaped extension, the extension from said first louver section being engaged in the slot in said runner first side-wall and the extension from said second louver section being engaged in the slot in said runner second side-wall, said extensions projecting within said runner channel, said third side-walls abutting against said vertical edges of said slots in proximity to said extensions, the fourth side-wall of said first louver section terminating in a substantially vertical edge which abuts against said runner first side-wall and the fourth side-wall of said second louver section terminating in a substantially vertical edge which abuts against said runner second side-wall, so as to prevent light leakage through said widened slot portions.

B1 4,189,079 (788th)
CONTROLLABLE DRIVE FOR TAPE RECORDER
Zenshiro Uehara, Tokyo, Japan, assignor to Tokyo Rokuon Kogyo Kabushiki Kaisha, Tokyo, Japan
Reexamination Request No. 90/000,661, Nov. 5, 1984.
Reexamination Certificate for Patent No. 4,189,079, issued Feb. 19, 1980, Ser. No. 913,513, Jun. 7, 1978.
Claims priority, application Japan, Oct. 31, 1977, 52-129641
Int. Cl.[4] B65H *17/22*
U.S. Cl. 226—188



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4 are cancelled.

New claims 5–7 are added and determined to be patentable.

[1. A controllable drive for tape recorder comprising a capstan rotatably mounted on a chassis, a flywheel mounted on and in concentric relationship with the capstan, a gear integrally connected with the flywheel in concentric relationship therewith, a toothed wheel with hiatus which is rotatably mounted on the chassis and disposed for meshing engagement with the gear, a cam integral with the hiatus wheel, a link disposed for angular movement on the chassis to be angularly driven by the cam for producing a force which is necessary to operate the tape recorder, a movable element mounted on the chassis so as to be engageable and disengageable from the hiatus wheel and operative to lock the hiatus wheel when a hiatus thereof is located in opposing relationship with the gear, and means for operating the movable element.**]**

B1 4,232,179 (789th)
PROCESS FOR PREPARING ETHENE
Helcio V. Valladares Barrocas, Niteroi; Joao B. de Castro M. da Silva, and Ruy Coutinho de Assis, both of Rio de Janeiro, all of Brazil, assignors to Petroleo Brasileiro S.A.-Petrobras, Rio de Janeiro, Brazil
Reexamination Request No. 90/000,378, May 9, 1983.
Reexamination Certificate for Patent No. 4,232,179, issued Nov. 4, 1980, Ser. No. 932,283, Aug. 9, 1978.
Claims priority, application Brazil, Aug. 9, 1977, 7705256[U]
Int. Cl.[4] C07C *1/24*
U.S. Cl. 585—640

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–12 are cancelled.

[1. Process for preparing ethene by dehydrating ethyl alco-

hol in the presence of catalyst, characterized in that ethyl alcohol is heated by indirect heat exchange, up to a temperature in the range from 180°–600° C., introducing thus heated ethyl alcohol into one or more adiabatic reactors containing in its interior a catalyst fixed bed, said adiabatic reactor being maintained in a pressure range between 0.2 and 20 kg/cm^2 absolute, and said fixed catalyst bed being maintained at a temperature comprised within the range from 600° C. on the top to 180° C. in the bottom, by means of a sensible heat carrying stream heated up to a temperature up to 800° C., the weight ratio between the sensible heat carrying fluid stream and the stream of ethyl alcohol varies within a 0.2:1 to 20:1 range, and the ratio between the amounts of ethyl alcohol and the catalyst is comprised within a range from 10 to 0.01 g/h of ethyl alcohol per gram of catalyst; removing the effluent from said adiabatic reactor and sending the same to the purification step.]

B1 4,329,090 (790th)

EMPLOYING QUICKLIME IN STABILIZING SURFACE LAYERS OF THE EARTH

Joe D. Teague, Fort Worth, and Paul J. Wright, Euless, both of Tex., assignors to Porta Batch Co., Fort Worth, Tex.

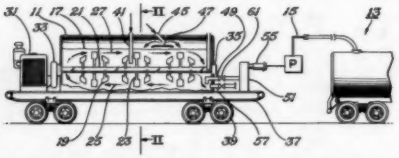
Reexamination Request Nos. 90/001,086, Sep. 12, 1986 and 90/001,153, Jan. 20, 1987.

Reexamination Certificate for Patent No. 4,329,090, issued May 11, 1982, Ser. No. 6,109,791, Jan. 7, 1980.

Continuation-in-part of Ser. No. 969,421, Dec. 14, 1978, Pat. No. 4,233,015.

Int. Cl.^{4} E02D *3/12*

U.S. Cl. 405—263



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A method of treating top surface layers of the earth for forming a stabilized base of controlled strength, movement and water permeability comprising the steps of:

a. admixing in a slurry mixing tank unslaked lime called quicklime and water to form a hot hydrated lime slurry at elevated temperature above ambient; and

b. working the hot hydrated lime slurry before said hot hydrated lime slurry cools below ambient temperature and while said hot hydrated lime slurry is at a temperature above ambient into the top surface layers of the earth such that for the first time it is economically feasible that said surface layers are treated in situ with a hot lime slurry to obtain the desired strength and stabilization to allow stabilization even when the ambient temperature decreases to 40° F. and lower.

B1 4,346,427 (791st)

CONTROL DEVICE RESPONSIVE TO INFRARED RADIATION

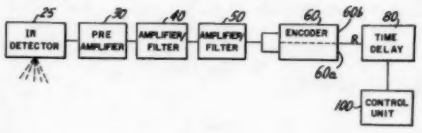
Kitson Blissett, Freeport, N.Y., and Robert A. Dunbar, Swampscott, Mass., assignors to Robert Rothenhaus, Bayside, N.Y., a part interest

Reexamination Request Nos. 90/001,022, Jun. 2, 1986 and 90/001,037, Jun. 20, 1986.

Reexamination Certificate for Patent No. 4,346,427, issued Aug. 24, 1982, Ser. No. 202,592, Oct. 31, 1980.

Int. Cl.^{4} H01H *47/24*

U.S. Cl. 361—173



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–58** are cancelled.

1. A device responsive to heat emanating from a human body for controlling an auxiliary current line, comprising

detection means including an infrared detector for producing detection signals in response to infrared radiation in the frequency spectrum emitted by the human body;

circuit means adapted to receive said detection signals for amplifying them and producing reset signals for those detection signals resulting from movement of a body emanating infrared radiation in said spectrum;

timing means adapted to receive said reset signals for producing a control signal after failing to receive a reset signal for a time period preselected to be longer than the time period expected between movements of a human body within the field of view of said detector; and

control means adapted to receive said control signal for controlling said current line in response thereto.

B1 4,428,768 (792nd)

PROCESS FOR THE RECOVERY OF PLATINUM GROUP METALS FROM REFRACTORY CERAMIC SUBSTRATES

Joseph G. Day, Holmer Green, England, assignor to Johnson Matthey & Co., Limited, London, England

Reexamination Request No. 90/000,775, May 3, 1985.

Reexamination Certificate for Patent No. 4,428,768, issued Jan. 31, 1984, Ser. No. 214,267, Dec. 8, 1980.

Claims priority, application United Kingdom, Dec. 31, 1979, 7944656

Int. Cl.^{4} C22B *4/00, 11/02*

U.S. Cl. 75—10.19

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **11** is cancelled.

Claims **1, 7** and **12** are determined to be patentable as amended.

Claims **2–6, 8–10** and **13–17**, dependent on an amended claim, are determined to be patentable.

New claims **18–20** are added and determined to be patentable.

1. A *secondary refining* process *employing a plasma arc furnace* for the recovery of platinum group metals present in [used] *a charge containing* auto emission control catalyst comprising a refractory ceramic substrate having the platinum group metal deposited on or contained in the refractory ceramic substrate, the said substrate containing an aluminum-silicate [and/or] *and carrying an* alumina *washcoat*, said process comprising preparing *the whole of the charge by mixing together;*

(*a*) *particulate refractory ceramic substrate bearing the washcoat and the said metals,*

(*b*) *one or more particulate fluxes,*

(*c*) *particulate iron collector material for the metal or metals to be recovered or particulate iron collector material precursor and*

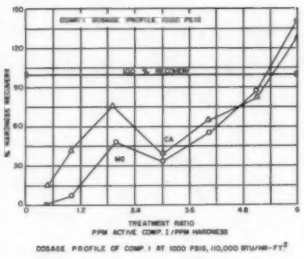
[in divided form, a charge containing the refractory ceramic substrate bearing the said metal, one or more fluxes, and a collector material or collector material precursor, for the metal or metals to be recovered, feeding said] (*d*) *any optional components of the charge, then feeding the* charge into a high intensity plasma arc furnace and heating the charge to a temperature in the range 1500°–1750° C. by means of the high intensity plasma arc of said furnace to produce a molten metallic phase containing a substantial proportion of the said metal or metals formerly deposited on or contained in the substrate, and a molten slag phase containing flux, ceramic residues and the remainder of the said metals, separating the two phases, and separating the platinum group metals from the metallic phase [the collector material comprising iron powder or filings, iron sponge or cast iron shavings].

B1 4,457,847 (793rd)

CARBOXYLATE POLYMERS FOR INTERNAL SCALE CONTROL AGENTS IN BOILER SYSTEMS

Walter F. Lorenc, Harvey; John G. Kelly, Woodridge, both of Ill., and Fredrick S. Mandel, Baton Rouge, La., assignors to Nalco Chemical Company, Oak Brook, Ill.

Reexamination Request No. 90/001,084, Sep. 9, 1986.
Reexamination Certificate for Patent No. 4,457,847, issued Jul. 3, 1984, Ser. No. 382,567, May 28, 1982.
Continuation-in-part of Ser. No. 318,665, Nov. 5, 1981, abandoned.
Int. Cl.[4] C02F *5/10*
U.S. Cl. 210—698



DOSAGE PROFILE OF COMP 1 AT 1000 PSIG, 110,000 BTU/HR-FT²

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **3**, **5**, **6**, and **13** are determined to be patentable as amended.

Claims **2**, **4**, **7–12** and **14**, dependent on an amended claim, are determined to be patentable.

1. A method of treating hardness *including calcium and magnesium* present in boiler waters which are in contact with heat transfer surfaces *exposed to boiler operating conditions* to prevent formation of scale *including calcium and magnesium* on, and to remove previously formed scale from, these heat transfer surfaces, which comprises treating the boiler waters with *a noncorrosive treatment composition substantially free of potentially corrosive chelants, and containing* a water-soluble sequestrant anionic vinyl polymer containing at least 30% by weight of carboxylate functionality, *said polymer being chosen from the group consisting of:*

(*a*) *homopolymers of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid;*

(*b*) *copolymers of one member of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid with at least one other member of the group consisting of acrylic acid, methacrylic acid, maleic acid, and fumaric acid;*

(*c*) *copolymers of at least one member of the group consisting of acrylic acid, methacrylic acid, maleic acid and fumaric acid with acrylamide;*

(*d*) *copolymers of at least one member of the group consisting of acrylic acid, methacrylic acid, maleic acid and fumaric acid with vinyl sulfonate; and*

(*e*) *hydrolyzed polyacrylamide;*

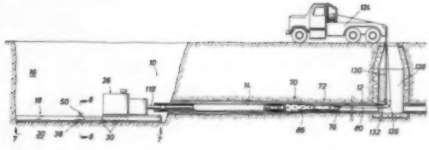
said polymer *further* having a molecular weight within the range of 500–50,000 and a chelation value of at least 200, which chelation value represents the milligrams of calcium or magnesium expressed in terms of calcium carbonate complexed by one gram of a sequestrant, and with the amount of said sequestrant anionic vinyl polymer *being based upon the amount of hardness present, and* being within the range of [1-30] *3–30* ppm *of polymer* per ppm *of* harness present in such boiler waters, whereby the hardness in the boiler waters is sequestered by the water-soluble sequestrant anionic vinyl polymer, thereby preventing formation of scale on, and removing previously formed scale from, the heat transfer surfaces [of boilers] *exposed to boiler waters.*

B1 4,507,019 (794th)

METHOD AND APPARATUS FOR REPLACING BURIED PIPE

Alan E. Thompson, Kilgore, Tex., assignor to Expand-A-Line, Incorporated, Pasadena, Tex.

Reexamination Request No. 90/001,085, Sep. 11, 1986.
Reexamination Certificate for Patent No. 4,507,019, issued Mar. 26, 1985, Ser. No. 468,137, Feb. 22, 1983.
Filed Sep. 11, 1986, Ser. No. 468,137
Int. Cl.[4] F16L *1/00, 55/18*
U.S. Cl. 405—154



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 3 and 11 are cancelled.

Claims **1**, **7–10**, **13**, **18** and **19** are determined to be patentable as amended.

Claims **2**, **4–6**, **12** and **14–17**, dependent on an amended claim, are determined to be patentable.

New claims **3** and **11** are added and determined to be patentable.

1. A method of replacing buried nonmetal tile pipe with replacement pipe having an internal diameter that may exceed the internal diameter of the existing buried fracturable tile pipe comprising:

(a) locating pipe fracturing and replacement apparatus in axial registry with the centerline of the pipe to be replaced, said pipe fracturing and replacement apparatus having a pipe fracturing mandrel of generally frusto-coni-

cal configuration and having a diameter at its leading extremity not greater than the internal diameter of said buried nonmetal tile pipe and a diameter at its trailing extremity which is greater than the outer diameter of said replacement pipe;

(b) simultaneously forcing said pipe fracturing mandrel through said buried tile fracturable pipe *by simultaneous linear and rotary components of movement*, reducing the pipe to be replaced to a fractured form having a multitude of pipe fragments of irregular form and forcing each of the pipe fragments of the fractured tile pipe radially outwardly into the surrounding earth formation thus forming a replacement pipe passage of a dimension exceeding the external dimension of the replacement pipe; and

(c) extending a replacement pipe into [the] *said replacement pipe* passage simultaneously with passage of said pipe fracturing mandrel through said buried nonmetal tile pipe.

B1 4,513,453 (795th)
PRE-TIED NECKTIE

Jiann Chen, and Ching H. Chen, both of No. 21, Alley 21, La. 244, Sec. 5, Yen-Ping North Rd., Taipei, Taiwan

Reexamination Request No. 90/001,140, Dec. 15, 1986.
Reexamination Certificate for Patent No. 4,513,453, issued Apr. 30, 1985, Ser. No. 496,057, May 19, 1983.
Int. Cl.[4] A41D *25/08*
U.S. Cl. 2—150

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. A necktie comprising an inner tie member, the upper end of said inner tie member being formed as a loop defining a neck-encircling opening; a zip fastener operatively mounted on said loop to enlarge and decrease the size of said opening, said zip fastener comprising a slide member having a slider plate

attached thereto; a knot support having a hollow upper portion which is generally oval when viewed from above and tapers downwardly to a depending tongue; and an outer tie member; said inner tie member being disposed within said hollow knot support with the lower end thereof depending from the knot support; the upper end of said outer tie member, said knot support, and said slider plate being joined, each to the others, by fixing means; said outer tie member being formed into a knot around said knot support.

REISSUES

DECEMBER 8, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

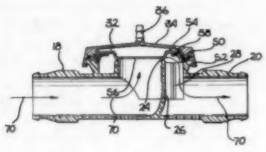
Re. 32,553
EXHALATION VALVE ASSEMBLY

Clifford D. Bennett, 6275 Sacramento, Alta Loma, Calif. 91701, and Charles Odenthal, 525 Euclid, Upland, Calif. 91786

Original No. 4,241,756, dated Dec. 30, 1980, Ser. No. 964,682, Nov. 29, 1978. Application for reissue Oct. 15, 1984, Ser. No. 661,233

Int. Cl.⁴ F16K *15/14*

U.S. Cl. 137—271 **12 Claims**



1. A valve assembly for use in a volume ventilator, comprising:

(a) a valve body in part defining a pressure chamber, *said valve body having an annular diaphragm seat*;

(b) a gas inlet conduit joined to and in flow communication with said pressure chamber for directing a gas into said pressure chamber, said gas inlet conduit forming a discharge port in said pressure chamber;

(c) a gas outlet conduit joined to and in flow communication with said pressure chamber for directing gas out of said pressure chamber;

(d) diaphragm means removably disposed in and extending across said valve body adjacent said discharge port for selectively closing off said discharge port, said diaphragm means defining the remainder of said pressure chamber;

(e) a removably disposed ring member extending into said pressure chamber from a position adjacent the periphery thereof;

(f) a plurality of positioning members disposed on said body for positioning said ring member in said pressure chamber such that said ring member supports a predetermined portion of said diaphragm means; and

(g) a cover having a gas inlet joined to said valve body and extending across said diaphragm means on the opposite side thereof from said pressure chamber;

(*h*) *said cover having an annular lip and said diaphragm means is sealed at its periphery between said annular lip and said diaphragm seat; and*

(*i*) *the removably disposed ring member interfitting with a portion of the diaphragm means and the valve body such that by removing said ring member a valve assembly having a substantially different valve area ratio may be achieved, permitting the valve assembly to be used in different volume ventilator circuits.*

Re. 32,554
VENT STRUCTURE

Dennis E. Murphy, Costa Mesa, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Original No. 4,033,247, dated Jul. 5, 1977, Ser. No. 641,429, Dec. 17, 1975. Application for reissue Nov. 7, 1977, Ser. No. 849,086

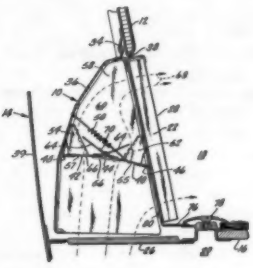
Int. Cl.⁴ B64D *13/04*

U.S. Cl. 244—118.5 **84 Claims**

1. A vent for equalizing the pressure on opposite sides of a structure comprising:

a movable vent panel which in a first position restricts the flow from a first side of the structure to a second side thereof; and

a plenum chamber pneumatically connected to the first side of the structure, said chamber having at least one movable wall having first and second sides, said first side of said movable wall being in pneumatic connection with the first side of the structure and said second side of said movable wall being in pneumatic connection with the second side of the structure so that differential pressure across the



structure applies force to said wall, and bias means for urging said movable wall into a first position, said movable wall being operatively connected to said vent panel to maintain said movable vent panel in said first position thereof when said movable wall is in its first position whereby a predetermined differential pressure is capable of overpowering said bias means to move said movable wall to a position which allows said movable vent panel to move to a second position wherein flow from the first side of the structure to the second side is less restricted.

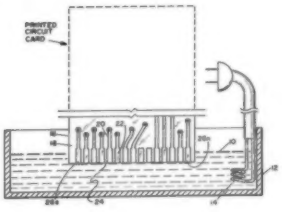
Re. 32,555
SOLDER STRIPPING SOLUTION

James J. Czaja, Maple Plain, Minn., assignor to Circuit Chemistry Corporation, Maple Plain, Minn.

Original No. 4,397,753, dated Aug. 9, 1983, Ser. No. 420,482, Sep. 20, 1982. Application for reissue Aug. 2, 1985, Ser. No. 761,864

Int. Cl.⁴ C09K *13/08*

U.S. Cl. 252—79.3 **31 Claims**



1. Solution for the removal of tin or tin-lead alloy solder from a copper or nickel base, said solution comprising:

(a) 20–150 g/l of a m-nitro substituted aromatic compound;

[(b) 0.5–10 g/l of a thiourea selected from a group of thiourea per se, an alkyl thiourea or an aromatic thiourea;]

[(c)] *b.* 0.1–50 percent by volume of an inorganic acid

selected from a group including fluoboric acid, fluosilicic acid, sulfamic acid, or nitric acid; and,

[(d)] c. 0.1–50.0 g/l of a hydroxyphenol providing extended life to the stripping solution.

Re. 32,556

PROCESS FOR RECOVERING CESIUM FROM CESIUM ALUM

Peter G. Mein, 2211 Twin Oaks Rd., Peru, Ill. 61354

Original No. 4,466,950, dated Aug. 21, 1984, Ser. No. 512,926, Jul. 12, 1983. Application for reissue Jul. 28, 1986, Ser. No. 889,904

Int. Cl.[4] C01G *45/12*

U.S. Cl. 423—599 10 Claims

1. A process for recovering cesium from cesium alum, $CsAl(SO_4)_2$, comprising:

(a) dissolving solid cesium alum in an aqueous hydroxide solution selected from the class consisting of aqueous sodium and/or potassium hydroxides, said solution having a hydroxide normality of from 0.5 to 4.0;

(b) forming cesium aluminum hydroxide, $CsAl(OH)_4$, and *sodium and/or* potassium sulfate[.] (*Na_2SO_4 and/or* K_2SO_4) with part of the *Na_2SO_4 and/or* K_2SO_4 precipitating;

(c) separating the solids from the supernatant solution;

(d) adding a water-soluble permanganate to the supernatant solution;

(e) forming a precipitate of cesium permanganate, $CsMnO_4$; and

(f) separating the $CsMnO_4$ precipitate from the residual solution to obtain cesium permanganate of high purity.

Re. 32,557

METHOD OF DETERMINING PREGNANEDIOL IN FEMALE URINE AND TEST DEVICE FOR USE THEREIN

Robert T. Chatterton, Chicago, Ill., assignor to Northwestern University, Evanston, Ill.

Original No. 4,450,239, dated May 22, 1984, Ser. No. 304,803, Sep. 23, 1981. Application for reissue Feb. 27, 1986, Ser. No. 833,600

Int. Cl.[4] G01N *33/53, 33/552, 33/544;* B65D *69/00*

U.S. Cl. 435—7 17 Claims

14. The method of determining the concentration of pregnanediol glucuronide (PG) in female urine, comprising:

(a) adding to a measured sample of said urine a predetermined quantity of antibodies binding to PG for reacting said antibodies with the amount of PG in the urine, said antibodies being in excess of the amount of PG to leave unreacted antibodies;

(b) contacting the antibody-containing sample with a quantity of a 20-α reagent immobilized on a support for reacting the antibodies which have not reacted with said PG with said 20-α reagent on said support, said 20-α reagent consisting essentially of a 20-α-hydroxy-4-pregnen-3-one, the said quantity of 20-α reagent being at least sufficient to bind the PG-unreacted antibodies;

(c) separating the residual urine sample from said support with said PG-unreacted antibodies bound thereto; and, thereafter,

(d) determining the amount of PG-unreacted antibodies thus separated from the urine sample as a measure of the PG concentration in the urine sample by (i) a color change reaction indicating separated antibody quantity, or (ii) by means of an enzyme associated with said separated antibodies which enzyme is capable of providing a color reaction indicating antibody quantity, or (iii) by means of a protein-staining dye which dye is capable of providing a color reaction indicating antibody quantity, or (iv) by means of a radiolabel associated with said separated antibodies which radiolabel is capable of providing an indication of antibody quantity.

PLANT PATENTS

GRANTED DECEMBER 8, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,053

ROSE PLANT NAMED SAVAMAE

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 25, 1985, Ser. No. 801,699
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by unusually attractive carrot red colored flowers of good exhibition form that hold color well through development and aging.

6,054

ROSE PLANT NAMED LAVCALE

Keith Laver, Caledon East, Canada, assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Nov. 25, 1985, Ser. No. 801,700
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized by unusually stable red flower coloring, near currant red, which maintains color through flower development and aging.

6,055

VARIETY OF GERANIUM NAMED DANIELLE

Daniel T. Busch, Thornton, Colo., assignor to Busch Greenhouses, Inc., Denver, Colo.

Filed Dec. 9, 1985, Ser. No. 807,172
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of geranium plant substantially as herein shown and described and parts therefor.

6,056

CARNATION NAMED LONDRENAS

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, La Londe, France

Filed Dec. 23, 1985, Ser. No. 812,357
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—70 1 Claim

1. The new and distinct carnation cultivar, substantially as herein shown and described, characterized in particular by its well formed, medium sized blooms of white color which are produced profusely in a recurrent manner during the spring, midseason and fall seasons.

6,057

CARNATION NAMED LONPACHEL

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, La Londe, France

Filed Dec. 23, 1985, Ser. No. 811,993
Claims priority, application France, Mar. 14, 1985, 5145
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 1 Claim

1. A new and distinct carnation cultivar, substantially as herein shown and described, characterized by the very light pink coloration of its medium sized flowers which are borne singly on sturdy, upright and rigid flower stems.

6,058

CHRYSANTHEMUM PLANT NAMED SOLO

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 10, 1985, Ser. No. 786,003
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of *Dentrenthema morifolium*, Ramat., named Solo, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 5 to 6 cm. at maturity; uniform seven week flowering response; medium plant height; spreading branching pattern; tolerance of both low winter 12° C. to 14° C. and high summer 23° C. to 38° C. temperatures for bud initiation and flower development; and golden yellow pollen-producing disc florets.

6,059

CHRYSANTHEMUM PLANT NAMED ADORN

William E. Duffett; Cornelis P. VandenBerg, both of Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Aug. 20, 1985, Ser. No. 767,360
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., named Adorn, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, daisy capitulum type, purple ray floret color, diameter across face of capitulum up to 8 cm., short plant height, semi-spreading branching pattern, average natural season flowering date of September 10 in the West Coast area, average flowering response period of seven weeks in photoperiodic controlled short day programs, and durable, uniform performance in Spring small pot flowering programs.

PATENTS

GRANTED DEC. 8, 1987

ERRATA

For CLASS	See PATENT NO.
130-027	4,711,075
182-106	4,711,282
439-108	4,711,506
439-292	4,711,507
439-595	4,711,508
439-587	4,711,509
439-246	4,711,510
439-347	4,711,511
425-206	4,711,602
437-052	4,711,699
502-209	4,711,903
525-356	4,711,949
379-040	4,712,097
346-001	4,712,172

PATENTS

GRANTED DECEMBER 8, 1987

GENERAL AND MECHANICAL

4,710,978

PROTECTIVE GARMENT FOR WATER ACTIVITIES

Bradford Pankopf, 267 Nieto Ave., Long Beach, Calif. 90803

Filed Jul. 14, 1986, Ser. No. 885,893

Int. Cl.[4] A62B *17/00*; A41B *7/00*

U.S. Cl. 2—2.1 R **8 Claims**

1. A protective garment for personal use as in water sport activities such as surfing, diving, water skiing and board sailing, said garment comprising:

a body covering formed of rubber-like sheet material having a thickness of at least three thirty-seconds of one inch, said covering including at least one tubular section for substantially containing a body extremity in snug-fit relationship, said tubular section terminating in an elongated orifice having an orifice annular measurement substantially greater than the annulus measurement of a cross section of said tube at a location contiguous to said terminating section whereby to accommodate putting on and removing said garment as a result of the greater annular measurement of sai[d] orifice.

4,710,979

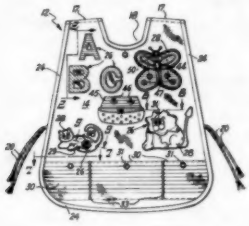
MOTHER'S APRON OR BIB WITH DETACHABLE MULTICOLORED TWO-DIMENSIONAL INFANT TOYS TO AID SUPERVISED BABY PLAY

Rebecca L. Bull, 1228 Pennsylvania Ave., LaPorte, Ind. 46350, and Kristine A. Shupert, 2334 W. Maple Dr., Union Mills, Ind. 46382

Filed Sep. 5, 1986, Ser. No. 903,990

Int. Cl.[4] A41B *13/10*; G09B *1/00*

U.S. Cl. 2—48 **6 Claims**



1. In an apron-like garment worn by a mother or babysitter having a front panel, a neck opening, a rear panel and means to tie the garment at the waist of the wearer and further having at least one two-dimensional applique figure for removable attachment and detachment by hook and pile type fastening means by the baby sitting on the lap of the mother or babysitter, that improvement consisting of

an additional movable sounding toy which is securely attached to the front of the apron and which is moved by the baby to create a sound, the detachment and reattachment of said applique toy figure developing the visual and motor skills of the baby while the movement and sounding toy developing the visual, motor and hearing skills of the baby; and

an additional toy figure in the form of a multicolored cat is secured to the front of said apron, said cat having a pocket, an iron metal plate within said pocket and a tether attached to said cat having a cloth ball surrounding a magnet, the tether permitting the baby to move the ball for attachment to the plate by magnetic forces.

4,710,980

PROTECTING GARNMENT USABLE IN PARTICULAR IN HAIRDRESSING SALONS AND NEW TYPE OF TOWEL INCORPORATED IN THE DESIGN OF SAID GARNMENT

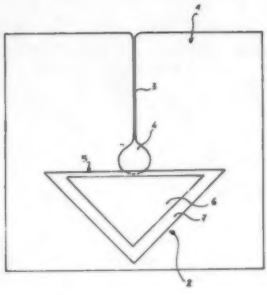
Bernard Brison, 9 chemin des Rivières, 69260 Charbonnieres; Jacques Galerneau, 92 rue G. Clémenceau; Alex Gontier, 44 chemin de Tafignon, both of Sainte Foy Les Lyon, and Gérard Petrozzi, 39 rue des Bienvenus, 69110 Villeurbanne, all of France

Filed Mar. 13, 1987, Ser. No. 25,728

Claims priority, application France, Mar. 13, 1986, 86 03779

Int. Cl.[4] A41B *13/10*

U.S. Cl. 2—50 **5 Claims**



1. Protecting garment usable in particular in hairdressing salons, of the type composed of an overall or cape, designed to be wrapped around the user's body, and of a towel adaptable on said overall, garment wherein:

the overall or cape is a one-piece garment, the geometrical shape of which is such as to allow a sufficient development to protect efficiently the user, said garment having a neck opening to allow the user's head through,

the towel at least is made from a complex material containing an absorbing non-woven material, and is triangular-shaped, said towel being provided along one of the sides of the triangle with means for securing it on the overall, at the level of the shoulders, at the back of the neck opening.

4,710,981

INTERACTIVE MESSAGE GARMENT

David J. Sanchez, 3430 Arbor Dr., Pleasanton, Calif. 94566

Filed Nov. 24, 1986, Ser. No. 934,431

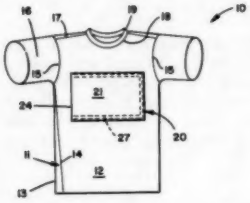
Int. Cl.[4] A41B *1/00*

U.S. Cl. 2—115 **5 Claims**

1. An interactive message garment comprising:

a garment of wearing apparel having at least a front panel and a rear panel joined in a sack-like configuration with arm openings and a neck opening at its top;

a flap means hingedly connected on said front panel in its central portion with a vertical hinge axis offset to one side of said front panel in a manner operable to allow one end of said flap means to be swung away from and swung against the outer surface of said front panel; and



a continuous gripping surface means arranged between said panel and the peripheral unhinged edges of said flap means operable to releasably maintain said flap against said panel whereby said flap means may be manipulated by the wearer of the garment to display written indicia under said flap means.

4,710,982

ZIPPER NECKTIE

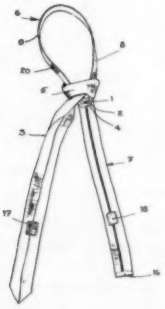
Martin Lande, 34 Glenmore Road, Hampstead, Quebec, Canada H3X 3M6

Filed Nov. 25, 1985, Ser. No. 801,694

Claims priority, application Canada, Nov. 1, 1985, 494395

Int. Cl.[4] A41D *25/02*

U.S. Cl. 2—150 **8 Claims**



1. In a necktie comprising: a slide fastener including a slide means, a knot portion having an opening therethrough, a front tie element depending from said knot portion, and a rear tie element having a lower end portion extending through said opening and having an upper neck embracing loop portion, said rear tie element comprising only one slide fastener stringer and a border of similar material as the front tie element sewn along a longitudinal edge portion of said stringer, said slide fastener stringer comprising a continuous string of interlockable elements of identical construction, said slide means being operatively connected to said interlockable elements for interlocking and unlocking said interlockable elements upon relative movement between said rear tie element and said slide means for varying the size of said neck embracing loop portion, said lower end portion of said rear tie element including interlocked portions of said rear tie element so that said border extends at least partially along opposite sides of said lower end portion.

4,710,983

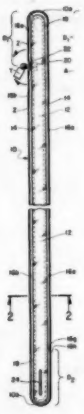
COMBINATION HANDBAG AND DRESS ACCESSORY ITEM

Bradley S. Markoff, 4912 Libbit Ave., Encino, Calif. 91436

Filed Mar. 26, 1987, Ser. No. 30,343

Int. Cl.[4] A41F *19/00*

U.S. Cl. 2—301 **10 Claims**



1. A dress accessory item convertible into a handbag comprising: an elongated flexible belt-like dress accessory item; and first and second courses of decorative fastener means each originating from a common point on the periphery of said belt-like accessory item and affixed to and extending in opposite directions around the peripheral edge portion of said accessory item, said first course of fastener means cooperable with said second course of fastener means for joining said peripheral edge portion of said accessory item together upon itself commencing initially at said common point and successively thereafter along the length of said courses of fastener means to form thereby a handbag.

4,710,984

HELMET FOR PROTECTION AGAINST IMPACTS AND A METHOD OF MANUFACTURING THE SAID HELMET

Jean-Jacques Asper, Croix De Rozon, Switzerland, and Rémi Cottenceau, Viry, France, assignors to Motul S.A., Aubervilliers, France

PCT No. PCT/CH85/00098, § 371 Date Feb. 14, 1986, § 102(e) Date Feb. 14, 1986, PCT Pub. No. WO86/00198, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 14, 1985, Ser. No. 847,901

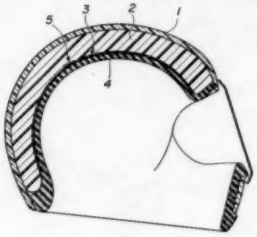
Claims priority, application Switzerland, Jun. 18, 1984, 2942/84

Int. Cl.[4] A42B *3/02*

U.S. Cl. 2—412 **4 Claims**

1. A helmet for protection against impacts, comprising a rigid outer protective shell, a first layer made from a non-elastically compressible material for absorbing the energy of the impact, an elastically compressible second layer forming the inner surface of the helmet, and an intermediate layer disposed between the two preceding layers for distributing the pressure exerted on both sides of a portion of the first layer for absorbing the energy of the impact over a large portion of the first layer, characterized in that the said intermediate layer is formed by a semi-rigid dome, which is independent of the outer protective shell and which is formed from a sheet mate-

rial of 0.3 to 1 mm thickness, of which the modulus of elasticity is between 1800 and 3500 N/mm^2, the elongation at rupture



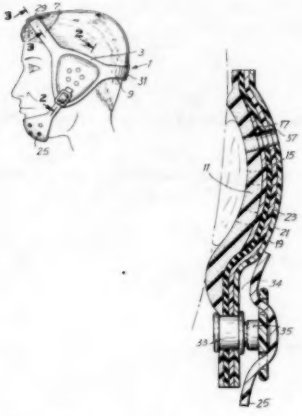
less than 100% and the ultimate tensile strength between 30 and 100 N/mm^2.

4,710,985

PROTECTIVE HEADGEAR FOR WRESTLER

Robert Dubner; Russel S. Dubner, and Todd A. Dubner, all of Roslyn Harbor, N.Y., assignors to Rebound Systems, Inc., Roslyn Harbor, N.Y.

Filed Mar. 10, 1982, Ser. No. 356,901
Int. Cl.[3] A63B 71/10
U.S. Cl. 2—425 **7 Claims**



1. A protective head gear for wrestlers including:

(a) a pair of ear guards each comprising:

a shock absorbing inner foam layer having a substantially triangular ridge adapted to engage the head surrounding the ear;

a non-stretchable outer vinyl;

a cross-linked polyethylene intermediate foam layer bonded to said outer vinyl and to said inner foam layer; and

a high density polyethylene non-deformable insert substantially trapezoidal in shape and adapted to receive the ear, the lower edge of which is above the mastoid bone, bonded to and between said inner foam and said intermediate foam layers, and the upper and side edges of which substantially contact said ridge of said inner foam layer;

(b) a top head strap integrally attached to each ear guard to pass over the top of the wearer's head;

(c) a rear head strap integrally attached to each ear guard to pass behind the wearer's head;

(d) engaging means to adjustably engage the straps of the respective ear guards comprising:

loops from a loop-hook fastener on the inner surface of said top and rear-head straps of one of said ear guards;

hooks from a loop-hook fastener on the outer surface of said top and rear head straps of the other of said ear guards;

(e) a safety strap having elastic loops at each of its respective ends surrounding said engaging means to hold said engaging means in engagement; and

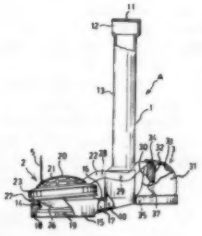
(f) a releasable chin strap releasably connecting said ear guards to engage the wearer's head substantially at his chin.

4,710,986

OUTLET VALVE FOR TOILET TANK

Ou Pi-Yu, No. 9, Alley 2, Ln. 247, Kuang-Chou Rd., Tainan City, Taiwan

Filed Apr. 24, 1986, Ser. No. 855,340
Int. Cl.[4] E03D 1/34
U.S. Cl. 4—382 **4 Claims**



1. An outlet valve for use in a toilet tank, comprising:

an outlet valve body having a vertically disposed overflow tube and a valve seat formed integrally at a lower end of said overflow tube said value seat being disposed slightly inclined forwardly and downwardly, said valve seat extending to one side of said overflow tube to form a generally L-shape with said overflow tube and provided with a valve port which communicates with said overflow tube,

a valve assembly having a front part formed as an inverted mesh disc and a rear part formed as a valve support means in the form of a U-shaped arm, a gas bag valve being affixed to a lower side of said mesh disc, said valve sealing said valve port from above, and the legs of said U-shaped arm being pivotably connected to a lower end of said over-flow tube thereby allowing the valve to be closable and openable with respect to the valve port the base of said U-shaped arm extending freely to the side of the tube opposite said valve seat,

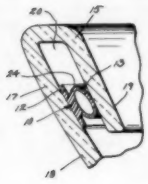
actuator means for manually lifting and opening the valve, and

a control member comprising a generally cup-shaped hollow body, a front wall thereof being provided with an upwardly projecting bar, said projecting bar including a stop formed adjacent a lower end of said bar, and a lower front end of said control member being pivotably connected to the lower end of said overflow pipe; said valve normally sealing the valve port while said free end of the arm is in contact with an upper portion of the projecting bar of said control means; when the valve is slightly opened upon manual operation said control means is inoperative to hold said valve in the open position; when said valve is completely open said free end of the arm is locked beneath said stop of said control means so that said valve is held in a completely open position until the water level fails to where the control means descends and unlocks the arm to enable the valve to descend upon said valve port.

4,710,987
TOILET RIM WATER DISTRIBUTOR

Randy O. Mesun, Sheboygan, and Frank Schobert, Plymouth, both of Wis., assignors to Kohler Co., Kohler, Wis.

Continuation of Ser. No. 791,943, Oct. 28, 1985, abandoned.
This application May 15, 1987, Ser. No. 53,512
Int. Cl.[4] E03D 5/00
U.S. Cl. 4—420 4 Claims



1. A water distributor suitable for use in a downwardly open flush rim of a toilet bowl, the rim being of the type having a fixed top wall and fixed at least partially downwardly directed sidewalls with one side wall having a flushing water inlet, said sidewalls being of the type devoid of support projections or grooves for the distributor, the distributor being freely removable from said rim, comprising:

a flexible compressible tube portion positionable under the top wall below said inlet to follow the bowl periphery with an upper surface suitable to support water flow in the rim above and outside of the tube, the tubular portion capable of being deformed to provide compressive retention of said distributor in said rim without the need for an adhesive;

a flexible generally flat planar side surface guide portion tangentially connected to the tube portion and extending above and below said tangential connection and positionable along one of the rim side-walls, and said guide portion having a plurality of at least somewhat downwardly directable water channels, said water channels extending through said planar portion to permit communication between a space above the distributor water support surface in the rim and the space below the distributor in the bowl, at least one of which extends in a manner to be in open communication with the rim sidewall such that the rim sidewall can form a sidewall for the channel.

4,710,988
FLUSH TOILET

John M. Stewart, Ontario, Canada, assignor to Sanitation Equipment Limited, Concord, Canada

Filed Feb. 19, 1986, Ser. No. 830,805
Int. Cl.[4] E03D 11/10
U.S. Cl. 4—438 15 Claims

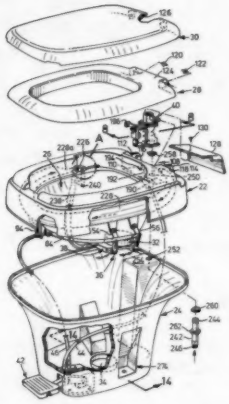
1. A flush toilet comprising:

a toilet bowl having a downwardly opening waste outlet at a lower end thereof surrounded by an annular sealing surface;

a housing for supporting said bowl above a floor surface, said housing defining an internal space below said bowl outlet for receiving waste from the bowl, and having a bottom wall that includes a waste disposal outlet from said space for connection to external waste disposal means;

a valve member adapted to co-operate with said annular sealing surface surrounding the bowl outlet, for closing said outlet;

means pivotally supporting said valve member for movement between a closed position which the valve member co-operates with said sealing surface and closes said bowl outlet, and an open position in which the valve member is disposed laterally of and clear of said bowl outlet, said pivotal support means including two unequal length links pivotally supporting the valve member, said links being spaced in the direction of movement of the valve member between said open and closed positions and constraining the valve member to swing away from said sealing surface while moving laterally towards said open position when the bowl outlet is to be opened;



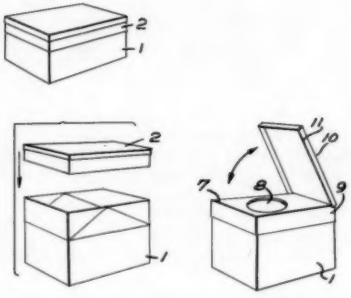
actuation means accessible from externally of the housing for moving the valve member between its closed and open positions; and,

flush means operable to deliver flushing liquid into the bowl at appropriate times.

4,710,989
DRY CLOSET

Bo Grenthe, 17 Gyllenehimsgatan, Vänersborg, Sweden S-462 00

Filed Dec. 2, 1985, Ser. No. 803,667
Claims priority, application Sweden, Nov. 30, 1984, 8406066
Int. Cl.[4] A47K 11/02, 11/04
U.S. Cl. 4—449 6 Claims



1. A portable, disposable, combustible dry closet made of corrugated cardboard or paperboard comprising a box-like bottom part and an upper seat part of lid-like construction which includes a flat top wall having an opening therein, said bottom part having a bottom wall and upright side walls, the upper portions of said side walls being foldable inwardly, at a location above said bottom wall so as to reduce the height of said bottom part for storage or transport and also form an

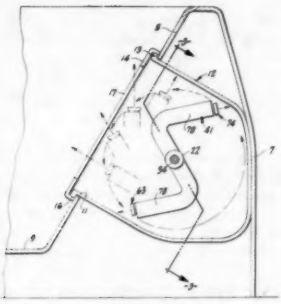
interior space between said location and said bottom wall for receiving absorbent material, and said side walls when not so folded forming an open top to said bottom part, said upper seat part being adapted to be fitted to said sidewalls when said side walls are either folded or unfolded.

4,710,990

AIR-WATER NOZZLE FOR A SPA TANK

Donald M. Morsey, 2121 Carlotta Dr., Sacramento, Calif. 95825

Filed Feb. 24, 1987, Ser. No. 17,956
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **6 Claims**



1. An air-water nozzle for a spa tank comprising:
a. a housing extending from a wall of said tank and open to said tank between a pair of housing side walls;
b. an S-shaped rotor having opposite ends;
c. means for mounting said rotor on said side walls for rotation about a horizontal axis, said rotor mounting means including coaxial nipples extending toward each other through said housing side walls;
d. walls in said rotor defining separate coaxial chambers each communication with a respective one of said nipples;
e. means in said rotor defining separate passages extending from both of said chambers substantially to the ends of said rotor;
f. means for conducting water under pressure through said rotor mounting means into said rotor for ejection from the ends thereof;
g. means for conducting air under pressure through said rotor mounting means into said rotor for ejection from the ends thereof; and,
h. means for mixing said water and said air prior to said ejection from said ends.

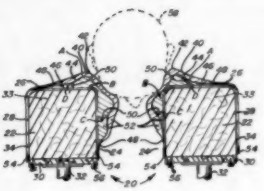
4,710,991

HEADREST PILLOW

Scott H. Wilmore, 7027 Woodland Dr., Eden Prairie, Minn. 55344, and Ronald D. Robinson, 3819 Tonkawood Rd., Minnetonka, Minn. 55345

Filed Jan. 21, 1986, Ser. No. 820,105
Int. Cl.[4] A47C *20/02*
U.S. Cl. 5—435 **22 Claims**

20. A pillow for engaging support and immobilization of the cervical spine of a person in a supine position, comprising
(a) a top plastic film having a predetermined length and width;
(b) an intermediate plastic film having a predetermined length and width sealed about its periphery to the top plastic film forming a closed upper chamber therebetween;
(c) a bottom plastic film having a predetermined length and width sealed about its periphery to the periphery of the intermediate film forming a closed lower chamber therebetween;
(d) at least two plastic film baffles within and extending the width of the lower chamber sealed to the intermediate and bottom films forming laterally oriented outer, intermediate and inner lower subchambers; and



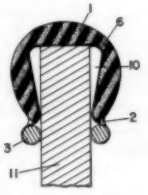
(e) a viscous gel within the upper chamber and outer, intermediate and inner lower subchambers.

4,710,992

WATERBED RAIL CAP

Bobby R. Falwell, Rte. 7, Box 696, Murray, Ky. 42071, and Orval H. Wooley, 7301 Annie La., Paducah, Ky. 42001

Filed May 1, 1987, Ser. No. 45,447
Int. Cl.[4] A47C *21/00*
U.S. Cl. 5—508 **3 Claims**



1. A rail cap for use on bedrails comprising:
a. a piece of foam or similarly flexible compressible padded material adapted to match and approximately cover the length and uppermost surfaces of a bedrail;
b. a cover mounted along the top surface of said foam material which cover is folded around the peripheral edges and secured to the lower surface of said foam material;
c. cylinders formed by and within the lengthwise outermost portions of said cover, said cylinders adapted for receiving a rigid structural member;
d. rigid structural members inserted within said cylinders leaving a gap in the center of each such cylinder such that said foam material and cover can be folded at their midpoint; and
e. a plurality of spaced apart spring clip means for forming said foam material and cover into a channel which slidably friction fits over said bedrail.

4,710,993

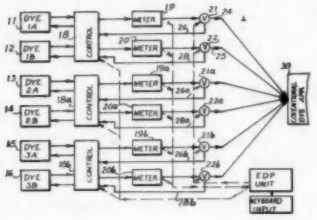
DYE COLOR CONTROL SYSTEM

Alvin W. Whaley, 2286 Dawnville-Beaverdale Rd., NE., Dalton, Ga. 30720

Division of Ser. No. 674,695, Nov. 26, 1984, Pat. No. 4,632,147.
This application Apr. 29, 1986, Ser. No. 856,965
Int. Cl.[4] D06B *23/00*; F17D *1/14, 3/01*
U.S. Cl. 8—158 **3 Claims**

1. A method for providing a color to a dyeing apparatus wherein said color comprises a mixture of a plurality of dyes, said mixture being provided for use in said dyeing apparatus, said method including the steps of feeding a first dye from a first tank, metering said first dye and establishing a rate of flow of said first dye, feeding a seocnd dye from a second tank, metering said second dye and establishing a rate of flow of said

second dye, said rate of flow of said first dye and said rate of flow of said second dye being such as to yield said color when said first dye and said second dye are mixed, and causing said first dye and said second dye to flow to said dyeing apparatus, said method further including the steps of defining a plurality



of colors in terms of said tanks and flow rates from said tanks, selecting some of said plurality of colors and establishing a sequence of said some of said plurality of colors, and subsequently carrying out said steps of feeding a first dye and feeding a second dye for providing each color of said some of said plurality of colors in said sequence.

4,710,994

METHOD OF FORMING A COMPOSITE STRUCTURAL MEMBER

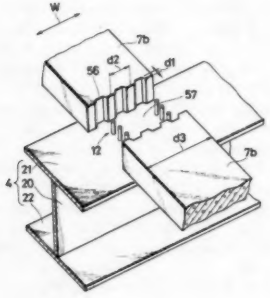
Hiroo Kishida, and Hirofumi Takenaka, both of Osaka, Japan, assignors to Harumoto Iron Works Co., Ltd., Osaka, Japan

Continuation of Ser. No. 668,821, Nov. 6, 1984, abandoned. This application Oct. 6, 1986, Ser. No. 915,900

Claims priority, application Japan, Nov. 7, 1983, 58-209599; Apr. 9, 1984, 59-70503

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—1 **3 Claims**



1. A bridge comprising:

a pair of abutments arranged in spaced relationship with each other;

a plurality of main beams placed in parallel with each other on and extending between said pair of abutments;

a plurality of concrete slabs having undulated end surfaces defining concave end recesses, said concrete slabs being disposed to extend transversely across and between said main beams in side-by-side and end-to-end fashion with undulated end surfaces of transversely adjacent said concrete slabs confronting each other;

dowels fixed to said main beams and extending upwardly therefrom into spaces defined between said concave end recesses of said confronting undulated end surfaces;

mortar filling said spaces and thereby integrally fixing said concrete slabs to said main beams; and

means for subjecting said concrete slabs to compressive stress acting thereon in the longitudinal direction of said main beams and thereby for imparting to said main beams a tensile force acting in said longitudinal direction thereof and a negative bending moment acting upwardly.

2. A method for constructing a bridge, said method comprising the steps of:

preparing a plurality of concrete slabs each having buried therein a plurality of sheath tubes extending parallel with each other, said preparing comprising forming each said slab with undulated end surfaces at opposite ends thereof;

arranging a pair of abutments in spaced relationship with each other;

placing a plurality of main beams in parallel with each other on and extending between said pair of abutments;

disposing said concrete slabs across said main beams such that said slabs are juxtaposed to extend across said beams and that said sheath tubes in said slabs extend parallel with the longitudinal direction of said beams, said disposing said slabs comprising positioning said slabs on and across said main beams at specified intervals such that said undulated end surfaces of said slabs face one another on said beams;

inserting pc steel wires into said sheath tubes in said slabs;

then producing in said slabs compressive stress acting in a direction parallel with said longitudinal direction of said main beams by applying tension to said pc steel wires by means of stretching means;

fixing said compressive stress to said slabs by means of fixing means;

fixedly securing said concrete slabs on said main beams to thereby integrate said slabs and beams, said securing comprising positioning dowels fixed to said main beams in spaces defined between the thus confronting undulated end surfaces and filling said spaces with mortar, thereby integrally securing said slabs to said beams; and

thereafter actuating said fixing means to adjustingly release said compressive stress acting in said slabs thereby producing in said beams a tensile force acting in said longitudinal direction of said beams and a negative bending moment acting upwardly.

4,710,995

ELECTRIC MOTOR DRIVEN TOOTHBRUSH

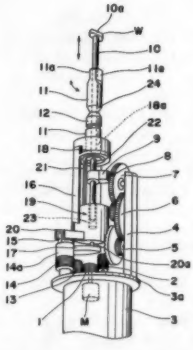
Hisashi Joyashiki, Takatsuki; Minoru Iwasawa, Moriyama; Masakazu Oohigashi, Yao, and Masao Terai, Kobe, all of Japan, assignors to Sunstar Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1986, Ser. No. 841,325

Claims priority, application Japan, Mar. 19, 1985, 60-56347; Mar. 19, 1985, 60-40768[U]; Mar. 19, 1985, 60-40769[U]; Jan. 31, 1986, 61-13447[U]

Int. Cl.[4] A46B *13/02*

U.S. Cl. 15—22 R **8 Claims**



1. A motor driven toothbrush comprising a housing having an end plate formed on one end portion of the housing, an

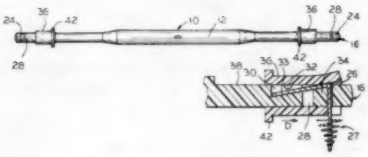
electric motor accommodated in the housing with the motor shaft projected outward of the housing through the end plate, a scrubbing shaft supported on a standard secured to the end plate of the housing for moving in a direction of the axis of the scrubbing shaft, a rolling shaft coaxially fitted to the scrubbing shaft for moving around the axis of the rolling shaft, first drive means driven by the rotation of the electric motor for driving said scrubbing shaft reciprocally in the axial direction, second drive means driven by the rotation of the electric motor for swinging said rolling shaft reciprocally around the axis of the rolling shaft, and adapter means having a toothbrush unit and being detachably mounted to the rolling shaft and/or the scrubbing shaft.

4,710,996

INTERDENTAL BRUSH HANDLE

Emanuel B. Tarrson, and Dane Maric, both of Chicago, Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Aug. 12, 1986, Ser. No. 895,872
Int. Cl.[4] A46B *3/08, 9/04*
U.S. Cl. 15—105 **11 Claims**



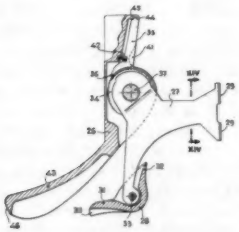
5. A handle for receiving and supporting interdental brushes, said handle comprising an elongated member having oppositely disposed tip ends which form an obtuse angle with respect to an axis of said elongated member, means on at least one of said tip ends for receiving and capturing either an individually associated twisted wire brush or a toothpick, and sleeve means slidable over said tip ends, said sleeve having an elongated slot for receiving said twisted wire brush and for capturing said toothpick, a side of said sleeve opposite said elongated slot capturing said twisted wire brush and covering a broken end of said toothpick whereby at least sid one tip end may optionally receive either a brush or a toothpick.

4,710,997

LAST-CASE FOR CLEANING FOOTWEAR

Felipe U. Hermida, Fuentemilanos 2 - hotel no. 3, Ciudad Puerta de Hierro, Madrid, Spain

Filed Jul. 31, 1984, Ser. No. 636,153
Claims priority, application Spain, Aug. 3, 1983, 273.882
Int. Cl.[4] A47L *23/18, 23/28*
U.S. Cl. 15—268 **15 Claims**



1. A last-case for use in cleaning footwear, the last-case comprising:

a wall cover adapted to be mounted in a substantially vertical position, the wall cover comprising a pair of projecting sections, the sections each being placed at an angle to the other;

an external cover detachably fixed to the lower edge of the wall cover and pivotable thereon between a closed position wherein the external cover and wall cover are substantially parallel, and an open position wherein the external cover is approximately at right angles to the wall cover; and

a last adapted for mounting in the last case, the last comprising:

an angular member having at least one end, the at least one end of the angular member being releasably fixed to the wall cover by a pair of interconnecting flaps, the angular member comprising a widened area defining a flat opening, the flat opening providing a housing;

a base member pivotally connected to the angular member between its ends;

a heel member connected to the at least one end of the angular member remote from the flaps;

a segmented, toothed wheel interjacent the angular member and the base member, the toothed wheel being fixed relative to the angular member and abutting the housing provided by the flat opening to prevent its rotation, the base member being rotable relative to the toothed wheel and including a housing, the housing being mounted over the widened area of the angular member and the toothed wheel;

a pawl member on the base member, one end of which is adapted to engage the toothed wheel to lock the base member in a plurality of positions relative to the angular member, the pawl being releasable from the toothed wheel to permit rotation of the base member in both directions;

a pin, the pin lying in an axis normal to the toothed wheel so that the base ember is pivotable about the pin relative to the angular member, the angular member, toothed wheel, and base member all being mounted about the pin, the pin comprising a head at one end and a threaded portion at another end;

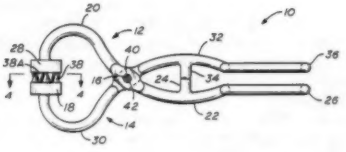
a locknut having an annular channel, the locknut being received by the threaded portion of the pin for securing the pin in position and being held by the engagement of the projecting sections of the wall cover which are received in the annular channel.

4,710,998

GAME SKINNING DEVICE

Daniel A. Gast, 4419 Trail Lake Dr., Houston, Tex. 77045

Continuation-in-part of Ser. No. 791,415, Oct. 25, 1985, Pat. No. 4,635,319. This application Oct. 20, 1986, Ser. No. 920,746
Int. Cl.[4] A22B *5/16*
U.S. Cl. 17—21 **7 Claims**



1. A hand operated animal skinning device comprising:

(a) a plurality of generally conical skin grasping teeth mounted with opposing teeth carrier members with said carrier members being respectively mounted at the ends of elongated jaw members;

(b) said teeth having rounded ends and being mounted in plural rows and spaced apart to permit teeth extending from one of said carrier members to intermesh and fit in between the teeth of the other of said carrier members;

(c) said jaw members being connected together through pivot means and adapted for pivotal movement from an open position into a forceful biting gripping position of said teeth against the skin of an animal wherein the conical surfaces of the opposing teeth laterally squeeze the skin into clamping contact between said conical surfaces without piercing or damaging said skin;

(d) a pair of handles respectively mounted at the ends of elongated handle respectively with said handle members being respectively joined with said jaw members at said pivot means; and

(e) said handle members being adapted to drive said jaw members into biting position when forced together about said pivot means by hand operation whereby said skin can be gripped and pulled away from said animal.

4,710,999

DEVICE FOR CLEANING SHELLFISH

Josef Brunner, A-6322, Niederbreitenbach 156, and Josef Ritzer, Schwaige 28a, A-6344 Walchsee, both of Fed. Rep. of Germany

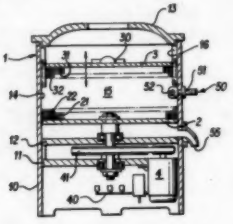
PCT No. PCT/DE85/00232, § 371 Date May 7, 1986, § 102(e) Date May 7, 1986, PCT Pub. No. WO86/00500, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 5, 1985, Ser. No. 855,816

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425884; Jan. 11, 1985, 3500787

Int. Cl.[4] A22C *29/00*

U.S. Cl. 17—65 **24 Claims**



1. Device for cleaning shellfish comprising a chamber (15) for accommodating a quantity of shellfish, the chamber having two approximately opposite walls that are comprised of substantially planar, bristle-bearing brush wheels (2,3) which can be moved in their planes in relation to one another, at least one of the brush wheels (2) being equipped with a motor (4) for rotation thereof relative to the other brush wheel, the chamber including at least one input port (50) and one output port (55) for a rinsing fluid.

4,711,000

HANDS-FREE CLAMPING DEVICE FOR HOLDING FISH OR GAME FOR CLEANING

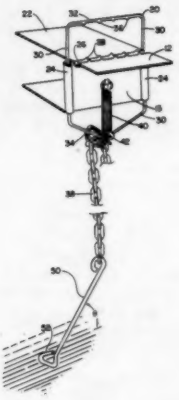
Jaye M. Bedsole, 16201 S.W. 283rd St., Homestead, Fla. 33030

Filed May 19, 1986, Ser. No. 864,505

Int. Cl.[4] A22C *25/06*

U.S. Cl. 17—70 **16 Claims**

1. A hands-free clamping fixture for immobilizing a fish or animal carcass to enable the cleaning and/or descaling thereof, comprising a base member, and a movable clamping device interacting therewith, said base member having a work surface, said movable clamping device principally comprising a component of generally U-shaped configuration, said component having a base portion and a pair of arms, and being inverted such that said arms extend downwardly away from said base portion, means on each side of said base member for guiding said arms for vertical movement, and for preventing undesirable lateral displacement of said arms during such vertical movement and a foot operated device for causing the base portion of said inverted U-shaped component to selectively move into a tightly clamping relation with said work surface, so as to firmly grasp and hold a portion of fish or animal placed on said work surface, and spring bias means for causing the



base portion of said component to return automatically to a release position when foot pressure on said foot operated device is sufficiently diminished.

4,711,001

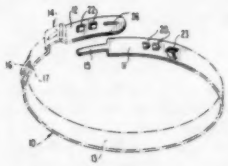
FASTENING ARRANGEMENT FOR OPEN HOSE CLAMP

Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen 2, Switzerland

Division of Ser. No. 622,766, Jun. 20, 1984, which is a continuation-in-part of Ser. No. 446,503, Dec. 3, 1982, Pat. No. 4,492,004. This application Oct. 23, 1986, Ser. No. 922,151

Int. Cl.[4] B65D *63/02*

U.S. Cl. 24—20 TT **15 Claims**



1. A clamp structure, comprising clamping band means having open ends, and means mechanically interconnecting the open ends of the band means including at least two outwardly extending hook means in an inner band portion operable to engage in aperture means in an outer band portion, at least one of the hook means being a cold-deformed support hook, another one of the hook means being a hook in the form of an outwardly directed tab-like member pressed-out of the band material of the inner band portion and extending generally in the longitudinal direction of the band means, said another hook being operable to initially engage in its corresponding longitudinally extending aperture means before engagement of the cold-deformed hook in its corresponding aperture means to absorb the circumferentially directed tightening forces until the cold-deformed hook becomes effective, and wherein said tab-like member is pressed-out of the band material in such a manner that a larger amount of band material, as viewed in the transverse direction, is left on one side thereof than on the other.

4,711,002

BAG TIE WITH PRESS RELEASE LEVER

Elsmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.

Filed Jan. 14, 1987, Ser. No. 3,372

Int. Cl.[4] B65D *77/10*

U.S. Cl. 24—30.5 P **16 Claims**

1. A bag tie with press release lever comprising:

an elongated member having a longitudinal axis, a retaining housing at one end, a flexible middle section, and a free end portion at another end;

a first wall of the retaining housing opposing a second wall of the retaining housing;

third and fourth walls of the retaining housing opposing each other and formed integrally with the first and second walls;

passage means for receiving the free end portion and the middle section through the retaining housing;

a corniculate lever connected at a narrow end to the first wall of the retaining housing for releasably retaining the middle section and disposed between said third and fourth walls with an enlarged outer extremity end extending above the second wall, said corniculate lever having a middle-section-engaging surface on a concave side of said lever, a press-to-release-actuating end, and is biased against movement of the enlarged outer extremity end below the second wall;

shaped means on the flexible middle section for releasably retaining the middle section in an engaged position within the retaining housing in cooperation with said middle-section-engaging surface of said lever; and

a tapered surface of the free end portion tapering away from said middle section.

4,711,003

COUPLING SYSTEM

Jerome D. Gelula, 535 E. 86th St., New York, N.Y. 10028

Continuation of Ser. No. 640,071, Aug. 13, 1984, Pat. No. 4,578,844. This application Mar. 21, 1986, Ser. No. 842,325

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.[4] A44B *17/00*

U.S. Cl. 24—631 **1 Claim**

1. A latching system comprising, in combination:

a support structure,

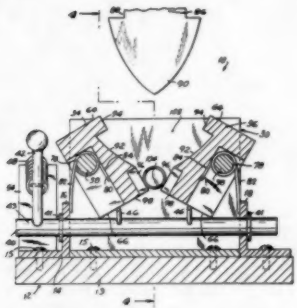
at least one capturing member supported for movement between capturing and releasing positions by said support member,

a locking member supported for movement between locked and unlocked positions by said support structure,

first spring means carried by said capturing member and interrelated with said supporting structure for biasing said capturing member toward said releasing position,

second spring means interrelated with said locking member and said support structure for biasing said locking member to said locked position,

unlocking means integral with said locking member for enabling movement of said locking member from said locked position to said unlocked position, said latching system further including another capturing member supported for movement between capturing and releasing positions by said supporting member, said another capturing member being mated with and opposed to said one capturing member, and further including another first spring means carried by said another capturing member, said another capturing member being interrelated with said locking member, said second spring means, and said locking means for movement synchronous with said one capturing member, said capturing members being rotatably connected to a pair of substantially parallel cylindrical pivots, said capturing members including top and bottom portions positioned on respective top and bottom opposing sides of said parallel pivots, said top portions being relatively distantly spaced and said bottom portions being approximately spaced in said releasing positions and said top and bottom portions being substantially equally spaced in said capturing positions, wherein said bottom portions of said capturing members include a bottom wall, said capturing members forming recesses in said bottom



portions opening at said bottom walls, said recesses being defined in part by rear surfaces transverse to the direction of rotation of said capturing members, and wherein said locking members include a cylindrical bar rotatably mounted on said support structure positioned below said bottom portions of said capturing members and substantially equidistant from said parallel pivots and substantially perpendicular to the direction of said parallel pivots, and two substantially parallel pins connected to and radically extending from said bar, said pins being in biased contact with said bottom walls of said capturing members in said unlocked position and positioned in said recesses with said rear surfaces being in biased contact with said pins in said locked position, said system further including an inserting portion formed with opposing convex surfaces and relatively reduced diameter portion defining a shoulder adapted to be obstructed when said inserting portion is releasably held.

4,711,004

APPARATUS FOR SHEARING A MOVING WEB OF MATERIAL

Alfonsius A. J. Van Dijk, St. Odilienberg, Netherlands, assignor to Johannes Menschner Maschinenfabrik GmbH & Co. KG, Viersen, Fed. Rep. of Germany

Filed Oct. 30, 1986, Ser. No. 925,887

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538922

Int. Cl.[4] D06C *13/00, 23/02*

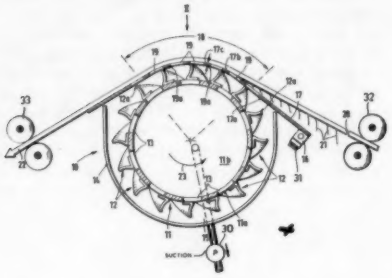
U.S. Cl. 26—15 R **8 Claims**

1. A shearing apparatus for shearing a web of moving material comprising:

a rotating shearing cylinder having a plurality of spiral shearing blades mounted on the outer circumferential surface of said shearing cylinder, each of said spiral shearing blades having a shearing edge and the axis of said shearing edge of said spiral shearing blade being at least

substantially parallel to the axial direction of said shearing cylinder; and

a spatially fixed nap height determining plate provided with a plurality of holes, the edges of which contact said shearing edges of said spiral shearing blades along a part of the



circumference of said shearing cylinder, the exterior side of said plate being the bearing surface for said web of material and the edges of said holes providing a plurality of opposing shearing edges for a plurality of said shearing edges of said shearing cylinder.

4,711,005

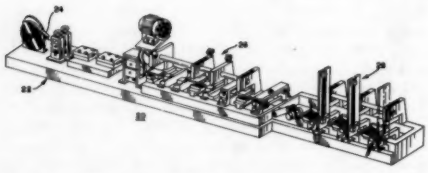
METHOD AND APPARATUS FOR MAKING SLATS FOR WINDOW BLINDS AND THE LIKE FROM A CONTINUOUS WEB OF PLASTIC MATERIAL

A-Shen Chang, Changhua Hsien, Taiwan, assignor to Joanna Western Mills Company, Chicago, Ill.

Continuation-in-part of Ser. No. 775,262, Sep. 12, 1985, Pat. No. 4,615,087. This application Jul. 14, 1986, Ser. No. 884,991

Int. Cl.[4] B23P *19/04, 23/00;* **B29C** *43/22*

U.S. Cl. 29—24.5 **20 Claims**



1. A method of forming slats for window blinds and the like from a continuous web of plastic material, comprising the steps of:

feeding said web from a roll thereof at a selected feed rate into a heating chamber;

heating a flat traveling segment of said web while moving longitudinally thereof through said heating chamber to a selected elevated temperature level ready for molding;

molding said heated web to form a curved transverse cross-section while cooling to a selected cooling temperature while traveling longitudinally through a cooling chamber to mold and permanently set said web into said curved transverse cross-section; and

thereafter cutting said cooled and molded web into slats of discrete length and punching openings therein ready for receiving flexible support elements to form said blinds.

10. Apparatus for making slats for window blinds and the like from a continuous web of plastic material, comprising:

feed roll means for directing said web from a supply roll in a longitudinal direction at selected feed rate into a heating chamber;

a heating chamber having upper and lower plates each having a longitudinal groove for defining a heating path for the longitudinal travel of a flat section of said continuous web between inlet and exit ends of said heating chamber, said grooves having heated, confronting, matching, opposite heating surfaces for heating contact with opposite sides of said traveling web moving adjacent thereof;

a cooling and molding chamber having an inlet end closely adjacent the exit end of said heating chamber and having upper and lower molding and cooling dies defining a longitudinal cooling and molding path for permanently molding and setting said web into a curved transverse cross-section, while a section of said web is traveling longitudinally toward an exit end of said cooling and molding chamber; and

exit feed roll means for directing said web exiting from said cooling and molding chamber longitudinally towards a cutting and punching section for cutting said web into slats of discrete length and punching openings therein ready for receiving flexible support elements to complete the formation of blinds from said slats at a final assembly section.

4,711,006

DOWNHOLE SECTIONAL SCREW MOTOR, MOUNTING FIXTURE THEREOF AND METHOD OF ORIENTED ASSEMBLY OF WORKING MEMBERS OF THE SCREW MOTOR USING THE MOUNTING FIXTURE

Dmitry F. Baldenko, Moscow; Nikolai P. Bezlepkin, Oktyabrsky Bashkirskoi; Jury V. Vadetsky, Moscow; Moisei T. Gusman, Moscow; Jury F. Potapov, Ljubertsy Moskovskoi, and Valery I. Semenets, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchnoissledovatelsky Institut Burovoi Tekhniki, Moscow, U.S.S.R.

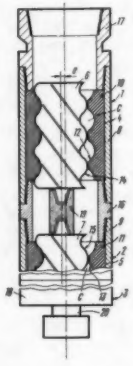
PCT No. PCT/SU85/00051, § 371 Date Mar. 17, 1986, § 102(e) Date Mar. 17, 1986, PCT Pub. No. WO86/00954, PCT Pub. Date Feb. 13, 1986

PCT Filed Jun. 27, 1985, Ser. No. 848,046

Claims priority, application U.S.S.R., Jul. 19, 1984, 3771625

Int. Cl.[4] B23P *15/00, 19/00;* **B23Q** *17/00*

U.S. Cl. 29—156.4 R **3 Claims**



1. A method of oriented assembly of successive working members of a downhole sectional screw motor which includes an output shaft, a moving section connected to the output shaft and incorporating successively arranged working members each working member including a stator and a rotor each having screw surfaces that interact with each other and having multiple screw starts that are equal for pairs of the surfaces, the like pairs of the adjacent working members being rigidly coaxially connected to each other, wherein the rigid coaxial connection of each like pair of the adjacent working members is made in the form of a solid threaded bushing using a frame including mounting elements each having multiple start screw profile surfaces, the number of multiple starts being equal and determined by the number of starts of screw threads on a screw

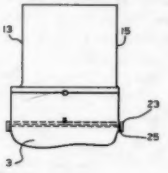
profile surface of a working member of the motor, coupling means for connecting the mounting elements in spaced relationship, a bushing carried in each mounting element and having a surface defining the screw profile surface, the bushings being installed coaxially with each other, one of the bushings being rigidly connected to the coupling means and the other bushing mounted for movement with respect to its longitudinal axis, a disk including securing means, the disc carried by one mounting element of the coupling the disk and the movable bushing each having angularly equidistantly spaced radial cuts whose number is equal to the number of starts in the profile surfaces of the mounting elements, which method comprises: superposing the profile surfaces of the working members of the motor and the bushings of the mounting elements of the mounting fixture, connecting like working members to each other by threaded bushings with a pre-securing movement along the threads superposing the profile surfaces of the bushings of the mounting elements of the adjusted mounting fixture respectively with the profile surfaces of the working members being connected, and securing the threads in the range of angular displacements of the connected working member within the limits of the permissible torques on the screwed threads until radial cuts on the disk and radial cuts on the movable bushing of the mounting element are aligned.

4,711,007

METHOD AND APPARATUS FOR INSTALLING FREE STANDING TURBINE BLADES

Kenneth C. Conrad, Birmingham, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1986, Ser. No. 912,872
Int. Cl.[4] B21K *3/04;* **B23P** *15/04;* **B64C** *27/48;* **F01D** *5/32*
U.S. Cl. 29—156.8 R **20 Claims**



1. A method of installing free standing turbine blades upon a rotor comprising the steps of:

(a) forming a plurality of serrations in a spaced relationship about an outer faced portion of said rotor, each of said serrations having a preselected cross-sectional area substantially conforming to the shape of a root portion of said blades, an inlet side, an exit side, and a bottom;

(b) inserting each of said blades into a respective one of said serrations;

(c) aligning an inlet face portion of each of said root portions with the inlet side of its respective serrations;

(d) inserting, at the exit side of each serration between its respective blade and bottom, a tapered shim;

(e) tapping each of said tapered shims;

(f) shaking each of said blades at a tip portion thereof to check for movement of its respective root portion;

(g) bending an excess portion of said tapered shim protruding from the exit side of serration back against the rotor; and

(h) repeating step (f).

12. Improved apparatus for preventing gouging and fretting of a blade root in a free standing blade installed in a serration formed on a turbine motor, said serration having an exit side, wherein the improvement comprises:

locking means coupled between the blade root and the serration; and

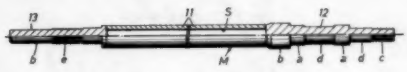
a tapered shim inserted beneath said locking means at an exit side of said serration, said tapered shim being wedged between said locking means and serration to secure the blade.

4,711,008

METHOD OF PRODUCING PROPELLER SHAFTS FOR JET-PROPELLED SMALL-SIZED BOATS

Yukio Nakamura, 3-19, 1-Chome, Tengachayakita, Nishinari-Ku, Osaka-Shi, Osaka-Fu, Japan

Filed Dec. 19, 1986, Ser. No. 943,399
Int. Cl.[4] B21K *23/00, 1/06, 3/00;* **F16C** *3/00*
U.S. Cl. 29—156.8 P **1 Claim**



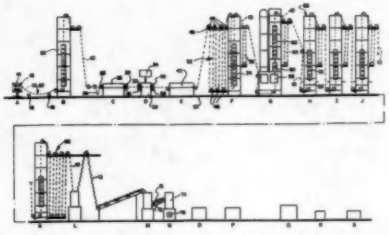
1. A method of producing propeller shafts for jet-propelled small-sized boats, comprising the steps of preparing a main shaft in the form of a hollow round bar, which is a finished part and a pair of auxiliary shafts shorter in length than said main shaft, in the form of solid round bars, which are roughly shaped parts, connecting and integrating said pair of auxiliary shafts with the opposite cut ends of said main shaft by the friction welding process utilizing heat of friction produced by relative pressurized rubbing movement between said parts, and, with said main shaft, which is a finished part, used as a standard, machining the surfaces of said auxiliary shafts, which are roughly shaped parts, to form mount surfaces for fitting thereon such parts as oils seals, bearings, and a propeller.

4,711,009

PROCESS FOR MAKING METAL SUBSTRATE CATALYTIC CONVERTER CORES

Richard C. Cornelison, Hiram, Ohio, and William B. Retallick, West Chester, Pa., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,698
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157 R **37 Claims**



1. A process for making a metal catalyst support core for a catalytic converter from a continuous metal strip, comprising the steps of:

(a) corrugating the metal strips,

(b) depositing at least one catalyst material on the corrugated metal strip,

(c) impressing fold lines on alternate sides of the strip along the entire length thereof, the fold lines extending transversely of the strip, and

(d) folding and gathering the strip along the fold lines impressed in step (c) to form a fan-folded metal catalyst support core.

4,711,010
METHOD OF SEALING OFF THE VAPORIZATION CHAMBER OF A STEAM IRON

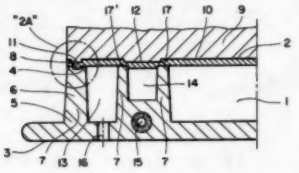
Robert Walter, Eppertshausen, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,783

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517018

Int. Cl.[4] B21D *53/00*; **B21K** *29/00*; **B23P** *15/26*

U.S. Cl. 29—157 R **1 Claim**



1. A method of sealing off outer and inner vaporization chambers provided in a metal sole plate of a steam iron by means of a metal cover, the outer vaporization chamber having an outer peripheral wall with an upper edge surrounding and spaced from the inner chamber defined by inner and outer walls, the method including forming a continuous groove the upper edge of in said outer peripheral wall of trapezoidal dovetail cross-sectional shape opening at said upper edge, choosing a material for said metal cover having a lower yield limit than the yield limit for the material of said metal sole plate, placing said metal cover over said vaporization chambers, applying pressure to said metal cover to force portions thereof into said continuous groove to fill said groove and force portions thereof into pressed engagement between said inner and outer walls of said inner chamber without substantially deforming said sole plate during said pressing.

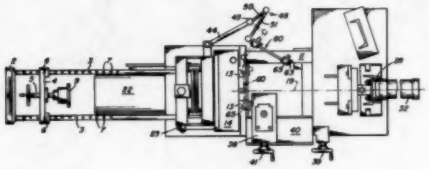
4,711,011
APPARATUS FOR EXTRACTING AN ELEMENT FROM AN ASSEMBLY

John G. Nugier, Burns, Tenn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 16, 1985, Ser. No. 766,307

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—239 **4 Claims**



1. Apparatus for extracting an element from an assembly comprising:

an elongated frame comprising a plurality of elongated parallel stringer members having spaced bores therein for securing a transverse support bar in said bores to provide a plurality of positions of said bar with respect to the frame;

a transverse support bar mechanism transversely positioned and detachably secured to said stringer members to support a portion of the assembly;

a first chuck means mountd on said frame which aligns with said support bar mechanism for holding a portion of the element to be extracted;

a tool means secured to said frame which is movable longitudinally to and away from said first chuck means and movable transversely to said frame;

a vise means secured to said frame which is longitudinally retractable to hold a portion of the element which is to be extracted;

an arm assembly including a second chuck means having a pair of jaws which extracts the element from the assembly being movable both longitudinally and axially towards said first chuck means comprising

a pair of rails located on the frame for supporting said second chuck means including means securing said rails in spaced apart and parallel relation to each other;

a pair of blocks supporting the jaws of said second chuck means, said blocks being attached to said rails and at least one of said pairs of blocks being movable along said rails; and

each of said pair of jaws of said second chuck means being secured to a respective one of said pair of blocks to move with said blocks and to move relative to said blocks in a direction transverse to the movement of said blocks.

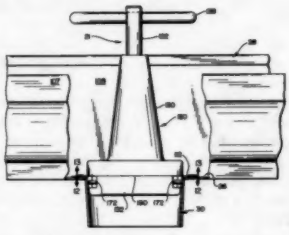
4,711,012
APPARATUS AND METHOD FOR INSTALLING GUTTER DROPS ON RAIN GUTTERS

Donald R. Wolters, Phoenix City, Ala., assignor to J & L Associates, Inc., Columbus, Ohio

Filed Sep. 18, 1981, Ser. No. 303,510

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—243.52 **7 Claims**



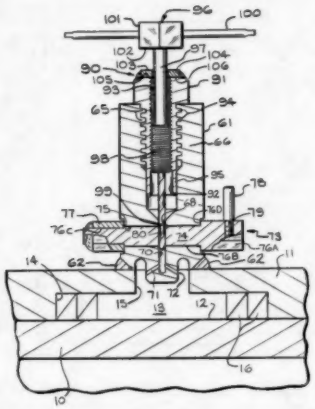
1. A portable, hand-carried swaging tool for swaging outwardly protruding formations in a flanged gutter drop to secure the gutter drop to a rain gutter, comprising

a housing structure having a housing portion which is configured and dimensioned for reception in the gutter drop after the gutter drop is inserted into a hole in the bottom wall of the rain gutter, a plurality of swaging dies mounted on said housing portion for movement between retracted and swaging positions, and means for selectively shifting said swaging dies from their retracted positions to their swaging positions while said housing portion is received in said gutter drop to swage said formations on the underside of said bottom wall and to thereby secure the gutter drop to said bottom wall by sandwiching said bottom wall between said formations and the flange of said gutter drop.

4,711,013
METHOD FOR REMOVING INJECTABLE MATERIAL FROM A PACKING CYLINDER

Daniel E. Hannah, Williamsville; Eugene W. Miliczky, Clarence; Clifford F. Bea, Alden, and Martin J. Hannah, Williamsville, all of N.Y., assignors to Advanced Thermal Systems, Inc., Lancaster, N.Y.

Continuation of Ser. No. 719,545, Apr. 3, 1985, abandoned. This application Jan. 8, 1987, Ser. No. 4,766
Int. Cl.[4] B23P 7/00
U.S. Cl. 29—402.02 6 Claims



1. A method for injecting packing material through a packing cylinder provides with a cavity at least partially defined by an internally threaded wall, a plunger provided with corresponding external threads, and a bore extending along the longitudinal axis of the packing cylinder towards an injection tip, said method comprising the steps of:

rotating said plunger to disengage it from the packing cylinder and checking for any sign of blow-back during disengagement,

during disengagement of the plunger, upon any sign of blow-back, rotating the plunger to reengage it with the packing cylinder and injecting packing material through at least one adjacent packing cylinder and repeating the method beginning with the step of rotating the plunger to disengage it,

rotating a reamer device to engage corresponding external threads provided thereon with those in the packing cylinder cavity, said reamer device including a shaft assembly provided with a bit and means mounting the shaft assembly in said reamer for selectively advancing and withdrawing said bit in the packing cylinder bore to remove packing material therefrom,

advancing said bit to remove packing material from the bore of the packing cylinder,

withdrawing said bit from the bore of the packing cylinder,

disengaging the reamer device from the packing cylinder cavity and checking for any sign of blow-back,

during disengagement of the reamer device, upon any sign of blow-back, rotating the reamer device to reengage it in the packing cylinder cavity and injecting packing material through at least one adjacent packing cylinder and repeating the preceding step,

inserting packing material into the cavity of the packing cylinder,

partially engaging said plunger in the packing cylinder cavity,

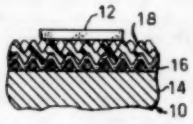
applying up to a given amount of torque to rotate said plunger to force the packing material through said bore,

during rotation of the plunger, upon the given amount of torque being exceeded, repeating the method beginning with the step of rotating the plunger to disengage it.

4,711,014
METHOD FOR HANDLING SEMICONDUCTOR DIE AND THE LIKE

Victor E. Althouse, Los Altos, Calif., assignor to Vichem Corporation, Stanford, Calif.

Division of Ser. No. 770,713, Aug. 29, 1985, Pat. No. 4,667,944. This application Jan. 29, 1987, Ser. No. 8,645
Int. Cl.[4] B32B 31/18
U.S. Cl. 29—412 9 Claims



1. A method of handling objects such as semiconductor chips, wafers, or like devices, said method including,

attaching an object to an air-impermeable flat sheet member by interfacial forces between said sheet member and said object,

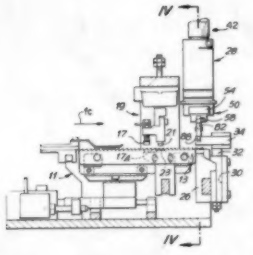
locating the flat sheet member on a porous texturized fibrous fabric having spaced high points at fiber crossovers,

drawing portions of said sheet member over said high points and between said crossovers by connection of said fabric to a vacuum source for withdrawing portions of said sheet member away from said object without forming a vacuum between said sheet member and said object for reducing the contact area and interfacial forces between said sheet member and said object to allow for the ready removal of said object from said sheet member.

4,711,015
APPARATUS FOR HANDLING AND ASSEMBLING AXIAL ELECTRONIC COMPONENTS ON PRINTED CIRCUIT CARDS

Ezio Tega; Fabrizio Piccini; Marco Mazzini, and Raffaello Magi, all of Arezzo, Italy, assignors to Metalmeccanica Gori & Zucchi M.G.Z, S.p.A., Italy

Filed Oct. 11, 1985, Ser. No. 786,875
Claims priority, application Italy, Oct. 17, 1984, 9514 A/84; Apr. 19, 1985, 9392 A/85
Int. Cl.[4] H01R 43/04
U.S. Cl. 29—566.2 6 Claims



1. Apparatus for assembling on printed circuit cards components having axially extending wire leads, comprising in combination: tools prearranged for cutting and bending said leads as well as engaging the resultant component, which tools operate at a common station, a mobile hand of a robot for carrying operatively some of said tools and for transferring said resultant component to a circuit card station for assembly

to a circuit card, said tools to be carried by said mobile hand comprising a bending member with two appendixes constructed to cooperate with separate counterpart members mounted at said common station for bending said leads into parallel relationship, means at said common station for feeding said components to a work station, said two appendixes being constructed with confronting surfaces having guide and retaining channels terminating at the ends of said appendixes in channels for centering said leads, said appendixes being arranged for holding said resultant components with said parallel-bent leads resiliently pressing against said confronting surfaces, a slide block associated with said bending member for sliding movement along said bending member and said appendixes, an axial actuation system carried by said mobile hand and constructed to cooperate operatively with said slide block for moving the latter to urge said resultant component from said appendixes so as to introduce said leads into holes of said printed circuit card, a body engageable and disengageable by said mobile hand, said body having a channel-like seat for removably receiving said bending member, cooperating wire cutting elements mounted at said common station with a first part of said cutting elements fixedly supported and a second part mounted for counter-movement relative to said first part, and means associated with said second part which means are actuatable by said mobile hand as the latter approaches said common station to actuate said wire cutting elements prior to accomplishing said bending of said leads.

4,711,016

FLEXIBLE MANUFACTURING UNIT

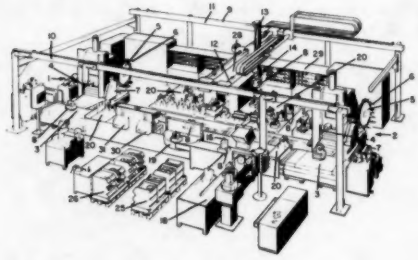
Henning Genschow, Vienenburg; Uwe Heisel, and Joachim Schuster, both of Berlin, all of Fed. Rep. of Germany, assignors to Werner and Kolb Werkzeugmaschinen GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 8, 1983, Ser. No. 550,083

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3243335; Feb. 4, 1983, 3304285

Int. Cl.[4] B23Q *3/156*

U.S. Cl. 29—568 **17 Claims**



1. Flexible manufacturing unit with at least two machine tools, a tool buffer store assigned to all machine tools, tool magazines, of which each is assigned to one machine tool adjoining it, and a single transport device for transporting tools and carriers, said transport device being movable in rectangular coordinates for individually transporting tools between the tool buffer store and the tool magazines and for the transport of work pieces fastened on the carriers, said unit being adapted to manufacture with random selection of tools and workpieces, said single transport device being developed in cross-portal construction and having a single gripping device for the tools and the carriers.

4,711,017

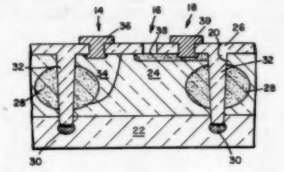
FORMATION OF BURIED DIFFUSION DEVICES

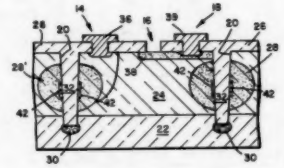
Michael D. Lammert, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 3, 1986, Ser. No. 835,571

Int. Cl.[4] H01L *21/00*

U.S. Cl. 437—20 **48 Claims**





1. A process for reducing collector parasitic resistance in a bipolar transistor having a collector, base and emitter, suitable contacts and metallization thereto, the process for forming said collector comprising:

(a) providing a P-type substrate;

(b) forming at least one lightly doped N^- region in the P-type substrate;

(c) etching a vertical trench in said N^- region to define the perimeter of said transistor;

(d) forming an N^+ region in the bottom of said trench;

(e) driving said N^+ region to a depth of about one-half the width of the device;

(f) etching said trench past said N^+ region into said P-type substrate region;

(g) forming a P^+ region in the bottom of said trench; and

(h) refilling said trench with insulating material.

25. A process for reducing collector resistance in a bipolar transistor having a collector, base and emitter and suitable contacts and metallization thereto, the process for forming said collector comprising:

(a) providing a P-type substrate;

(b) forming a lightly doped N region in the P-type substrate;

(c) etching a vertical trench in said N^- region to define the perimeter of said transistor;

(d) oxidizing the walls of said trench;

(e) anisotropically etching to remove oxide formed on the bottom of said trench;

(f) etching said trench an additional amount within said N^- region to expose silicon along a portion of the walls of said trench;

(g) diffusing an N-type species into said exposed silicon of said trench to form a N^+ region;

(h) driving said N^+ region by diffusion to a depth of about one-half the width of the device;

(i) etching said trench past said diffused region into said P-type substrate;

(j) forming a P^+ region in the bottom of said trench; and

(k) refilling said trench with insulating material.

36. A process of reducing collector resistance in a bipolar transistor having a collector, base and emitter and suitable contacts and metallization thereto, the process for forming said collector comprising:

(a) providing a P-type substrate;

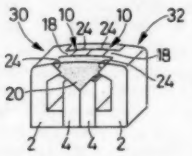
(b) forming a lightly doped N^- region in the P-type substrate;
(c) etching a vertical trench in said N^- region to define the perimeter of said transistor;
(d) oxidizing the walls of said trench;
(e) anisotropically etching to remove oxide formed on the bottom of said trench;
(f) etching said trench an additional amount within said N^- region to expose silicon along a portion of the walls of said trench;
(g) diffusing an N-type species into the exposed silicon of said trench to form an N^+ region;
(h) driving said N^+ region by diffusion to a depth of about one-half the width of the device;
(i) forming a metal silicide on the exposed walls of said trench, on said N^+ diffused region;
(j) anisotropically etching the bottom of said trench to remove the silicide formed thereon;
(k) etching said trench past said diffused region into said P-type substrate;
(l) forming a P^+ region in the bottom of said trench; and
(m) refilling said trench with insulating material.

4,711,018

METHOD OF MANUFACTURING A MAGNETIC HEAD CORE

Soichiro Matsuzawa, Kuwana, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Jan. 2, 1985, Ser. No. 688,502
Claims priority, application Japan, Jan. 14, 1984, 59-5203; Apr. 14, 1984, 59-5204
Int. Cl.⁴ G11B 5/42
U.S. Cl. 29—603 **7 Claims**



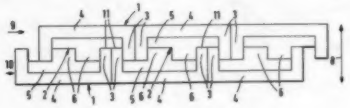
1. A process of manufacturing a composite magnetic head core, which comprises the steps of:
(a) butting and bonding together a first ferrite core element having a C-shaped portion, and a second ferrite core element having a rectangular portion, so as to close an opening of the C-shaped portion with the rectangular portion, thereby forming a first integral core assembly having a generally annular magnetic circuit which includes a coil-winding aperture defined by and between the first and second ferrite core elements, and a magnetic gap of a predetermined width defined by opposed end portions of the first and second core elements at one end of said first integral core assembly and formed transversely across an annulus of the magnetic circuit, said opposed end portions forming contact surfaces on which a magnetic recording medium is displaceable in sliding contact;
(b) cutting at least one inclined groove in the opposed end portions of the first and second ferrite core elements to define a width of at least one track for slidably contacting with said magnetic recording medium, said at least one inclined groove being formed in a direction from said opposed end portion on said second ferrite core element, toward said opposed end portion on said first ferrite core element, such that a bottom portion of the inclined groove is inclined with its depth decreasing toward the first ferrite core element and such that a depth of the inclined groove at the position corresponding to said magnetic gap is greater than a depth of the magnetic gap;
(c) preparing a second integral core assembly with at least one inclined groove by following the above recited steps (a) and (b), and butting together the first and second integral core assemblies at the second ferrite core elements thereof with a predetermined clearance left therebetween such that said at least one inclined groove in the first integral core assembly is maintained in a predetermined positional relationship with said at least one inclined groove in the second integral core assembly in a direction along the length of said at least one track; and
(d) placing a glass material over said inclined grooves, melting the glass material to fill said inclined grooves with molten glass, and concurrently to fill said predetermined clearance with molten glass thereby bonding the first and second integral core assemblies to form the composite magnetic head core.

4,711,019

METHOD OF MAKING CORE LAMINATIONS, AND PUNCH DIE FOR CARRYING OUT THE METHOD

Bernhard Albeck, Waiblingen-Neustadt, and Siegfried Goedicke, Urbach, both of Fed. Rep. of Germany, assignors to Schwabe GmbH, Urbach, Fed. Rep. of Germany

Filed Mar. 18, 1986, Ser. No. 840,919
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510854
Int. Cl.⁴ H01F 3/04
U.S. Cl. 29—609 **6 Claims**



1. A method of making, from a flat strip of electrical sheet steel, core laminations for an electrical inductive element, such as a ballast, choke, or transformer, in which the core laminations include:
essentially U-shaped integral laminae having two parallel projecting side, or outer, legs (3) and a connecting or middle leg (4) therebetween, and
essentially T-shaped integral laminae having a projecting center leg (6) and a cross leg (5),
comprising, in accordance with the invention, the combination of the steps of
punching the essentially U-shaped laminae (1) in interdigited positions in which the respective outer edges of the connecting legs (4) define opposite sides of the punching strip; and
defining for the essentially T-shaped laminae, positions in which a first essentially T-shaped lamina has its center leg (6) projecting - with respect to the width (8) of the strip - in a direction opposite to the direction of projection of the side leg (3) of a first U-shaped lamina (1),
and punching the first essentially T-shaped lamina in a position in which
(a) one side of the center leg (6) fits against an inner edge of the side leg (3) of said first essentially U-shaped lamina (1), and
(b) the other side of the center leg (6) fits against a side of a center leg of a neighboring essentially T-shaped lamina, and in which the neighboring T-shaped lamina has its center leg projecting in a direction opposite the direction of projection of the center leg of the first lamina.

4,711,020

TOP END-STOP ATTACHING MACHINE WITH IMPROVED TOP END-STOP SUPPLYING APPARATUS

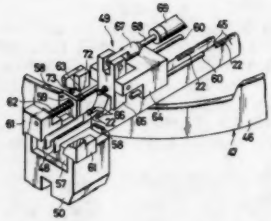
Kozo Watanabe, Kurobe; Akiyoshi Kando, Uozu, and Yoshiyuki Horita, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 29, 1986, Ser. No. 901,658

Claims priority, application Japan, Sep. 5, 1985, 60-196628; Sep. 13, 1985, 60-140105[U]

Int. Cl.[4] A41H *37/06*

U.S. Cl. 29—767 14 Claims



1. A top end-stop attaching machine including an apparatus for supplying top end stops of a substantially U-shape one at a time to a holding portion of the attaching machine, said apparatus comprising:

(a) a vibrating parts feeder;

(b) a first elongate guide rail cantilevered to said parts feeder and extending therefrom toward the holding portion, said first guide rail having an upper longitudinal edge along which the top end stops are fed successively from said parts feeder toward a free end of said cantilevered first guide rail by the vibration of said parts feeder and said first guide rail;

(c) a reciprocable second elongate guide rail disposed between the holding portion and said first guide rail and having an upper longitudinal edge normally extending flush with said upper longitudinal edge of said first guide rail, said second guide rail being reciprocably movable between a receiving position in which one end of said second guide rail is held in contact with said free end of said first guide rail, and a delivery position in which the other end of said second guide rail is held in registry with the holding portion, said second guide rail being normally held in said receiving position; and

(d) a delivery unit disposed above said first guide rail and reciprocably movable toward and away from the holding portion to deliver a leading top end stop from said first guide rail by way of said second guide rail to the holding portion, said delivery unit being engageable with said second guide rail within a limited range of its reciprocating stroke for moving said second guide rail from said receiving position to said delivery position.

4,711,021

METHOD OF INSTALLING A FEMALE ELEMENT TO A PANEL AND INSTALLATION APPARATUS

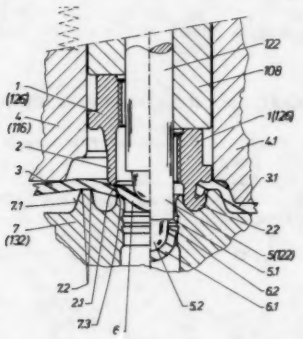
Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 869,507, Jun. 2, 1986, which is a division of Ser. No. 657,570, Oct. 4, 1984, Pat. No. 4,610,072, which is a continuation-in-part of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, which is a continuation-in-part of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 563,833 is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, which is a division of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Oct. 27, 1986, Ser. No. 923,526

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610675

Int. Cl.[4] B23P *11/00, 19/00*

U.S. Cl. 29—798 10 Claims



1. A method of attaching a female element to a panel, said female element including a body portion having a bore therethrough and a generally annular piercing and riveting portion extending from said body portion in general coaxial alignment with said body portion bore, said piercing and riveting portion including a free end and a piercing surface adjacent said free end, said method including the following steps:

(a) supporting a panel on a die member, said die member including an annular die cavity surrounding a projecting annular die portion, said die portion surrounding a central die bore and having a die cutting edge adjacent its upper surface and located at the inner edge of said annular die cavity, and a panel supporting surface generally surrounding said annular die cavity supporting said panel, said upper surface of said annular die portion being spaced below the plane of said panel supporting surface;

(b) biasing said annular piercing and riveting portion free end against said panel with said piercing and riveting portion piercing surface in general coaxial alignment with said die cutting edge;

(c) driving the free end of a punch having a rounded end surface through said female element bore and said annular piercing and riveting portion thereby doming a first panel portion into said central die bore;

(d) driving said annular piercing and riveting portion piercing surface against said panel and said die cutting edge thereby piercing said domed first panel portion from said panel forming a pierced panel opening and a panel slug, and said punch driving said domed first panel portion slug into said central die bore; and

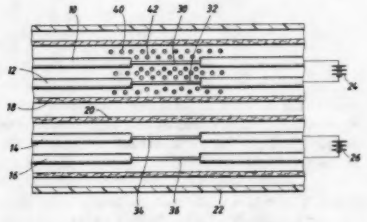
(e) continuing to drive said female element piercing and riveting portion free end against said panel adjacent the pierced edge of said panel, through said pierced panel opening into said annular die cavity, deforming said piercing and riveting portion free end and said panel, forming a mechanical interlock between said female element piercing and riveting portion and said panel.

4. An installation apparatus for attaching a female element to a panel, said female element having a body portion, a generally annular piercing and riveting portion extending from said body portion and a bore extending through said body portion generally coaxially aligned with the opening through said annular piercing and riveting portion, said annular piercing and riveting portion having a free end and a piercing surface adjacent said free end, said installation apparatus including a plunger having an annular end portion adapted to engage said female element body portion, a punch telescopically received in said plunger and reciprocal through said annular end portion and said female element, said punch having a rounded free end, and a die member having an annular die cavity configured to receive said female element piercing and riveting portion free end surrounding a projecting annular die portion surrounding a central die bore, said annular die portion having a die cutting edge adjacent its upper surface and located at the inner edge of said annular die cavity and said die member having a panel supporting surface generally surrounding said annular die cavity, said upper surface of said annular die portion being spaced below the plane of said panel supporting surface, said plunger first biasing said female element against a panel supported on said die member panel supporting surface thereby deforming said panel into said die cavity against said annular die portion upper surface preloading said panel, the rounded free end of said punch then doming the panel portion overlying said die central bore, said plunger then driving said piercing and riveting portion against said panel to pierce said domed panel portion from the remainder of said panel and said punch telescopically receivable in said central die bore to drive the pierced panel slug into said central die bore and continuing to drive said female element piercing and riveting portion free end against said panel adjacent the pierced edge of said panel, through said pierced panel opening into said annular die cavity, deforming said piercing and riveting portion free end and said panel, forming a mechanical interlock between said female element piercing and riveting portion and said panel.

4,711,022
METHOD FOR WIRE INSULATION

Clarence S. Freeman, and Katherine M. Freeman, both of 16242 Katherin La., Channelview, Tex. 77530

Filed Mar. 26, 1986, Ser. No. 844,144
Int. Cl.[4] H01R 43/00
U.S. Cl. 29—825 4 Claims



1. The process of electrochemically coating a metallic wire made of a metal having a positive ionic disposition, which comprises

preparing a water solution including in solution a polymer with anionic groups and at least one noninvolved cationic substance,

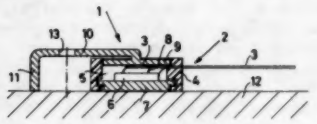
placing the length of the wire to be insulation coated in the solution, and

passing a small dc current through the solution so that the wire in solution becomes an anode, the substance with cations being left in solution and a hydrophobic insulation being chelated on the wire, there being an anionic-cationic linkage established between said polymer and the metal of the wire.

4,711,023
PROCESS FOR MAKING SINGLE-IN-LINE INTEGRATED ELECTRONIC COMPONENT

Giuseppe Marchisi, and Carlo Cognetti De Martiis, both of Milan, Italy, assignors to SGS-Antes Componenti Elettronici S.p.A., Catania, Italy

Division of Ser. No. 701,221, Feb. 13, 1985, Pat. No. 4,649,460.
This application Dec. 15, 1986, Ser. No. 941,336
Claims priority, application Italy, Feb. 17, 1984, 19668 A/84
Int. Cl.[4] H01R 43/00
U.S. Cl. 29—827 2 Claims



1. A process for making a single-in-line integrated electronic component comprising:

providing a metallic frame with electric contacts,

molding an insulating package on said metallic frame to form an inner space,

providing a heat dissipator at the bottom of said inner space,

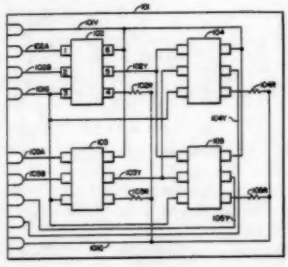
mounting a semiconductor chip on said heat dissipator in said inner space and electrically connecting said semiconductor chip to said contacts, and

arranging an insulating cover at the top of said inner space, said insulating cover being provided with a lateral extension having a turned end flush with the package bottom and at least one bore for the passage of a fastening means for the fastening of the component to a support surface.

4,711,024
METHOD FOR MAKING TESTABLE ELECTRONIC ASSEMBLIES

Robert J. Russell, Boston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 564,977, Feb. 3, 1984, abandoned, which is a division of Ser. No. 315,594, Oct. 30, 1981, Pat. No. 4,556,840. This application Nov. 21, 1985, Ser. No. 800,488
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] H05K 3/30
U.S. Cl. 29—832 1 Claim



1. A method of making an electronic assembly that can be tested using a reciprocal quiescence testing technique comprising the steps of:

A. manufacturing a printed circuit board having means for mounting electronic components, and having means for electronically connecting predetermined terminals of said electronic components;

B. only mounting electronic components on said electronic assembly that have one or more quiescence control inputs

which can be optionally removed wherein if said optional removable quiescence control inputs are removed said electronic component will be in a functional state;

C. connecting said one or more quiescent control inputs of each of said electronic components to receive one or more quiescent control signals;

D. providing means for placing each of said electrical components in a functional state during normal operation;

E. providing means for placing all but one of said electronic components in a quiescent state when using said reciprocal quiescence testing technique; and

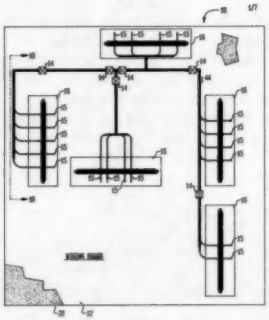
F. providing means for placing said one of said electronic components in said state when using said reciprocal quiescence testing technique; whereby during normal operation all electronic components are in a functional state, but during the testing of said electronic assembly, all said electronic components can be placed in a quiescent state at one time by application of said one or more quiescent control signals to said one or more quiescent control inputs yet allowing each electronic component to be placed in a functional state when that particular electronic component is a target component being tested whereby said target component can be tested in selective isolation from other electronic component connected to said target component's inputs or outputs, and whereby said testing can be conducted with little or no analysis of the interconnection of said electronic components within said electronic assembly.

4,711,025

METHOD AND APPARATUS FOR FORMING ELECTRICAL HARNESSES

Joseph J. DeSanto, 14 Hillcrest Rd., Belle Mead, N.J. 08502

Filed May 5, 1986, Ser. No. 860,004
Int. Cl.[4] H01R *43/00*; H02G *3/00*
U.S. Cl. 29—854 **14 Claims**



1. A method for assembling an electrical wire harness comprising the steps of:

locating wire end terminating means having a Velcro ®-like base on a wiring board at locations where wires are to begin and end;

locating wire gathering units having Velcro ®-like surfaces on their bases on said wiring board along the path where the wires of the electrical harness will pass;

routing wires from wire end terminator units through wire gathering units until the complete wire harness is formed;

tightening the wire gathering units so that the wires of the electrical harness stay in place;

removing the assembled electrical harness and wire gathering units assembly from said wiring board;

placing the assembled electrical harness in an electrical chassis having electronic components therein so that the Velcro ®-like surfaces of the wiring gathering mate units with Velcro ®-like targets on the electrical chassis thereby securing the harness to the electrical chassis; and,

connecting the free wire ends of the electrical harness to the electrical components on the electronic chassis.

5. An apparatus for forming a wire harness comprising:

a board having a surface;

a first type of attaching means covering at least a portion of said board surface for mating with a second type of attaching means;

wire gathering means attached to said second type of attaching means for gathering and holding one or more electrical wires;

wire end holding means also attached to said second type of attaching means for holding the end of one or more of said electrical wires,

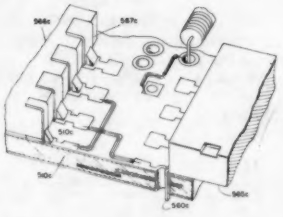
wherein one of said two types of attaching means comprises a hook material and the other of said two types of attaching means comprises a loop material so that said wire gathering means and said wire end holding means may be selectively attached to the surface of said board and a wire harness formed by running at least one of said electrical wires from one wire end holding means through at least one wire gathering means to at least one other wire end holding means.

4,711,026

METHOD OF MAKING WIRES SCRIBED CIRCUIT BOARDS

Brian E. Swiggett, Huntington; Ronald Morino, Sea Cliff; Raymond J. Keogh, Huntington, all of N.Y.; Jonathan C. Crowell, Lakeville, Mass.; George Czenczy, Northport, N.Y.; Andrew J. Schoenberg, Huntington, N.Y., and Marju L. Friedrich, Babylon, N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jul. 19, 1985, Ser. No. 756,722
Int. Cl.[4] H01K *3/10*
U.S. Cl. 29—850 **34 Claims**



1. A process for scribing at least one conductor onto a surface of a substrate in a predetermined pattern between two points spaced apart on the surface each defining a terminal point comprising:

a. providing a conductor having an adhesive coating, which is normally non-tacky and non-blocking prior to curing, which can be activated by applying energy thereto, said adhesive coating rapidly reverting to a solid non-tacky condition within about 0 to about 200 miliseconds after activation;

b. scribing the conductor onto the surface of the substrate from a first terminal point along a predetermined path to a second terminal point;

c. activating at least a portion of the adhesive coating on the conductor prior to, or simultaneously with contact with the substrate surface so that a bond is formed adhering the conductor to the surface of the substrate when said activated adhesive reverts to said solid non-tacky condition;

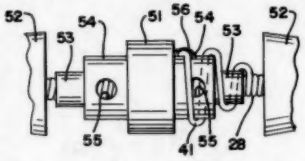
said reversion of said adhesive to a non-tacky state within about 0 to 200 milliseconds permitting the scribing speed along a straight path to reach a potential speed of at least 120 inches per minute while simultaneously substantially

avoiding relative movement of the bonded conductors with respect to each other and the substrate surface.

4,711,027
IMPLANTABLE LEAD CONSTRUCTION

Donald L. Harris, Key Largo, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 672,334, Nov. 16, 1984, Pat. No. 4,627,439, which is a continuation-in-part of Ser. No. 561,648, Dec. 15, 1983, Pat. No. 4,567,901. This application Aug. 4, 1986, Ser. No. 892,959
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—869 **23 Claims**



1. A method for constructing an implantable lead, comprising:

positioning a first section of flexible insulating polymeric sheath over a coiled conductor member having an insulator coating;

providing a short annular sheath over said coiled conductor member, said short annular sheath being radially recessed with respect to and axially extending beyond said first insulating sheath section;

uncoiling a length of said coiled conductor member and removing a portion of its insulator coating to form a free conductor length having an uninsulated portion;

wrapping at least a portion of said free conductor length generally around at least a portion of said short annular sheath;

engaging an electrode member into electrical communication with said uninsulated portion of said free conductor length;

butting together said electrode member and said first section of flexible insulating polymeric sheath until one axial face of said electrode member engages an axial face of said first section of insulating polymeric sheath; and

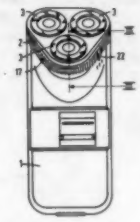
sliding a second section of flexible insulating polymeric sheath over said coiled conductor member and butting together said electrode member and said second section of flexible insulating polymeric sheath until another axial face of said electrode member engages an axial face of said second section of insulating polymeric sheath.

4,711,028
DRY-SHAVING APPARATUS WITH A HOLDER FOR CIRCULAR CUTTING UNITS

Wijtse Bergsma, and Klaas T. Oord, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1986, Ser. No. 944,299
Claims priority, application Netherlands, Jan. 24, 1986, 8600154
Int. Cl.[4] B26B *19/14*
U.S. Cl. 30—43.6 **6 Claims**

1. A dry-shaving apparatus comprising a holder for a circular cutting unit; said cutting unit including an external cutting member formed with hair-entry apertures, having an outwardly extending annular flange portion, and movable transversely relative to the holder, and an internal cutting member rotatably drivable relative to the external cutting member; a retaining plate positioned inside the holder; means to detachably secure the external cutting member to the retaining plate, the internal cutting member being retained between the external cutting member and the retaining plate, said means including two resilient arms engaging around the flange portion of the external cutting member and secured to the retaining plate;

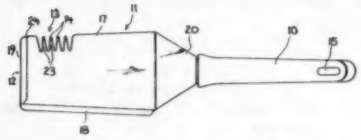


and spring means associated with the retaining plate to move the same transversely relative to the holder.

4,711,029
COOKERY IMPLEMENT

John B. Somerset, Armadale, Australia, assignor to McPherson's Limited, Australia

Filed Aug. 21, 1986, Ser. No. 899,214
Claims priority, application Australia, Aug. 21, 1985, PH2062
Int. Cl.[4] C21D *1/00*
U.S. Cl. 30—148 **3 Claims**



1. A cookery implement comprising a handle having a predetermined width, a substantially flat blade lying in a predetermined plane and having a first end and a second end defining a longitudinal axis for said blade, said blade including first and second side edges extending substantially along said longitudinal axis, a connecting portion for connecting said handle to said first end of said blade, said connecting portion extending angularly upwards and away from said first end of said blade out of said predetermined plane so that said handle is offset from said blade, said blade extending from said connecting portion substantially along said longitudinal axis and having a width transverse to said longitudinal axis which is substantially greater than said predetermined width of said handle, a first cutting edge formed along said first side edge of said blade, a second cutting edge formed along said second end of said blade, and a plurality of spaced prongs provided at said second side edge of said blade, said plurality of spaced prongs being located in spaced relationship from said first and second second ends of said blade so that at least a portion of said second side edge extends on both sides of said plurality of spaced prongs, each of said plurality of prongs extending generally transversely to said second side edge and being generally contained within the predetermined plane of said blade and having a narrow tip at its extremity which does not project substantially beyond said second side edge of said blade.

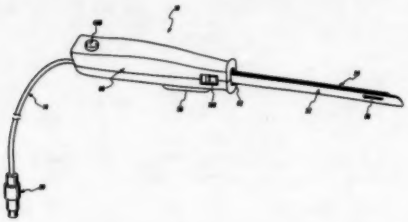
4,711,030
VARIABLE SPEED FILLET KNIFE

Robert B. Ruston, Sr., P.O. Box 357, Merryville, La. 70653

Filed May 5, 1986, Ser. No. 859,463
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—272 A **6 Claims**

1. A portable, hand-held electric knife having dual cutting blades, a DC electric motor, power conductors electrically connected to the DC electric motor for conducting current

from a remote storage battery, the DC electric motor including an armature shaft and a gear assembly mechanically coupling the dual cutting blades to the armature shaft, the gear assembly including a support shaft, a pair of bevel gears mounted for rotation on opposite ends of said support shaft, a beveled pinion gear engaged with said first and second bevel gears, said beveled pinion gear being mechanically coupled to the armature shaft of said DC electric motor, each cutting blade including a force transmitting end member movably coupled to one of the beveled gears for converting rotary motion of said armature shaft to linear counter-reciprocating motion of said cutting blade, each cutting blade having an elongated slot formed intermediate the force transmitting member and the cutting end, with the respective elongated slots being disposed in overlapping alignment with each other; and, a fulcrum shaft lodged within said housing and projecting through said overlapping slots.



4,711,031

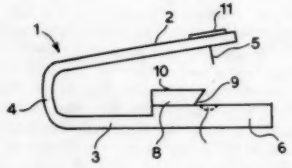
ENVELOPE OPENER

Joan Annello, Landisville, N.J., assignor to Paul Joseph Anello, Landisville, N.J.

Filed Jul. 16, 1986, Ser. No. 886,228

Int. Cl.[4] B67B *7/00*

U.S. Cl. 30—294 **8 Claims**



1. A device for opening an envelope, comprising:

a body of generally U-shaped longitudinal cross-section, comprising first and second walls each having first and second ends, said first and second walls being joined at the first ends, the second ends being free, said second ends being capable of movement toward each other, said walls each comprising a first surface facing toward the other wall and a second surface facing away from the other wall;

a cutting blade fixedly attached to the first surface of said first wall and projecting therefrom;

a thickened end portion formed on the first surface of said second wall and extending toward the second end of the second wall, said thickened end portion forming a flat guiding surface for the envelope;

an abutment means attached to the thickened end portion, comprising a substantially planar abutment edge which forms an acute angle with respect to the guiding surface and which guides the envelope therealong, and an upper surface for engaging the first wall when said first and second walls are pressed toward each other, said blade having a length which is greater than the thickness of the abutment means;

a hole formed in the thickened end portion which is located to receive the cutting blade when the first and second walls are pressed toward each other, said hole having a depth which is greater than the difference between the distance the blade projects from the first wall and the thickness of the abutment means;

wherein when said first and second walls are pressed together, the cutting blade and abutment edge are spaced from each other a pre-determined distance apart corresponding to the width of a slice to be cut off the envelope, the location and dimensions of the hole being such that the blade does not contact the perimeter of the hole.

4,711,032

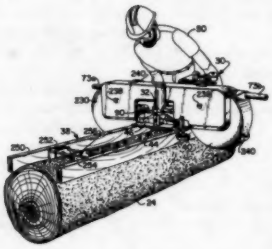
PORTABLE SAW MILL

Clifford P. Rickmers; Robert D. Donovan, both of Tupelo, Miss., and Louis C. Brickner, Jr., Pittsburgh, Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Sep. 5, 1985, Ser. No. 772,898

Int. Cl.[4] B27B *15/02*

U.S. Cl. 30—372 **10 Claims**



1. A portable saw mill for cutting lumber from a log, comprising:

(a) a frame adapted to be disposed transversely of the log;

(b) a pair of horizontally spaced apart wheels adapted to straddle the log, the wheels being rotatably supported by the frame for rotation in a vertical plane;

(c) a band saw blade positioned around the wheels for movement transversely of the log;

(d) means for rotating at least one of the wheels to cause the blade to form a cut in the log as the frame is moved longitudinally along the log;

(e) vertically adjustable support base means for supporting the frame relative to a top surface of the log so as to enable vertical adjustment of the band saw blade relative to the top surface of the log, the support base means including a platen, a pedestal interconnected to the platen having a plurality of substantially horizontal, vertically adjustable legs for supporting and leveling the platen, and handle means interconnected to the pedestal for vertical adjustment of the support base;

(f) a guide roller interconnected to the frame and adaptable to various shaped logs, said roller being movable longitudinally upon the log as it is being cut for guiding the frame along the log as the frame advances whereby the blade is kept in a zone of cutting as the blade cuts the log lengthwise; and

(g) handle means interconnected to the frame for facilitating movement of the frame longitudinally of the log by a user.

4,711,033
APPARATUS FOR AND METHOD OF SETTING THE HEIGHT OF A DESK CHAIR

Peter P. Mitchell, 210 Sylvan Dr., Englewood Cliffs, N.J. 07632

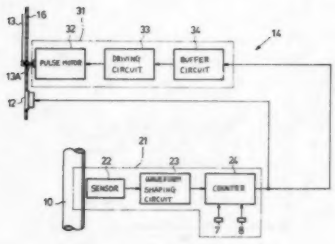
Filed Dec. 29, 1986, Ser. No. 947,902
Int. Cl.[4] G01B 5/00
U.S. Cl. 33—169 R 9 Claims

1. An apparatus for setting the height of a desk chair for a person, the apparatus comprising:
- a base adapted to stand on the floor;
- a guide fixed to and extending vertically up from the base;
- a support vertically slidable in the guide;
- clamp means for arresting the support in the guide at any of a multiplicity of vertically offset positions therealong;
- a rigid arm extending horizontally from the support and having an outer end; and
- a dependent gauge element displaceable between a horizontal position nested in the arm and a vertical position depending straight down from the arm outer end and having a lower end 1 in to 2 in below the outer end of the arm in the vertical position.

4,711,034
ELECTRONIC MEASURING DEVICE

Hiroshi Koizumi, Kawasaki, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 929,042
Claims priority, application Japan, Nov. 13, 1985, 60-254292; Nov. 15, 1985, 60-256205; Nov. 15, 1985, 60-256206
Int. Cl.[4] G01B 3/22
U.S. Cl. 33—172 E 8 Claims

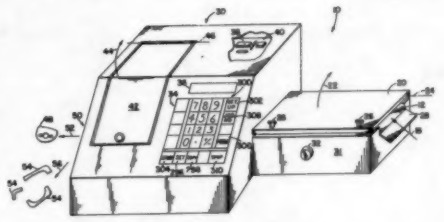


1. An electronic measuring device comprising:
- a spindle slidably disposed in the axial direction in the main body and having at its tip a probe;
- couter means having a sensor whose elements are disposed on said main body and on said spindle in corresponding positions and are adapted for converting relative displacement therebetween into an electrical signal, said counter means operating to count the number of pulses in said electrical signal supplied from the sensor, said pulses corresponding to said relative displacement;
- a digital indicator for indicating a measured value in a digital form on the basis of said counted value supplied from said counter device;
- pointer rotating means including a pulse motor and a driving circuit for rotatingly driving a pointer on the basis of said counted value supplied from said counter device to said driving circuit, said pointer rotating means further including a buffer circuit for controlling the rate of supplying pulses to said driving circuit; and
- a scale for enabling said measured value to be read by cooperating with said pointer, said measured value thereby being read from the outside of said main body by means of said pointer and said scale, and said digital indicator.

4,711,035
METHOD AND APPARATUS FOR MAKING A PATTERN FOR A LENS OPENING IN AN EYEGLASS FRAME

David J. Logan, Glastonbury; Kenneth O. Wood, Ellington; William Hernandez, Madison, and Richard L. Edwards, Windsor Locks, all of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Dec. 8, 1987, Ser. No. 896,615
Int. Cl.[4] G02C 7/02
U.S. Cl. 33—200 16 Claims



1. Apparatus for generating a pattern for a lens opening in an eyeglass frame, said apparatus comprising:
- means for containing an instruction set to control the operation of said apparatus;
- means for providing a plurality of data points collectively representative of the size and shape of an associated lens opening in an eyeglass frame;
- means for feeding a blank from a supply of blanks to a work station associated with said pattern generating apparatus;
- means for fixturing the blank at the work station;
- means for rotating the blank fixtured at the work station;
- cutter means located in the region of the work station for cutting the blank fixtured at the work station, and
- means for moving said cutter toward and away from the fixtured blank in accordance with the instruction set as the fixtured blank rotates relative to said cutter movement to make a pattern having the size and shape of the associated lens opening corresponding to said plurality of data points.

4,711,036

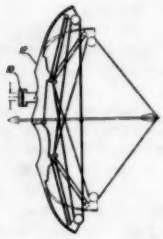
PENDULUM OPERATED OSCILLATING BOW SIGHT

Eddy Morris, Box 17, Level Acres, Eufaula, Ala. 36027

Filed Jan. 23, 1986, Ser. No. 821,892

Int. Cl.[4] F41G *1/46*

U.S. Cl. 33—265 11 Claims



1. An oscillating bow sight for use in aiming a bow and arrow comprising a plate member for connection to the bow, said plate member having means defining an elongated track therein, a lower means mounted on said plate member for rotation relative thereto and having a weighted means and an arm means secured thereto and disposed approximately ninety degrees from one another, said arm means having a carriage means secured thereto and received in said elongated track, and sighting means projecting radially from said carriage means and disposed in the line of sight of an archer using the bow.

4,711,037

DEVICE FOR MEASURING DIMENSIONS OF OBJECTS

Mohammad M. Saadat, 219 Cherry St., Katonah, N.Y. 10536

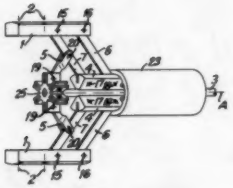
Continuation of Ser. No. 712,684, Mar. 18, 1985, abandoned.

This application Aug. 26, 1986, Ser. No. 902,062

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1984, 3412253

Int. Cl.[4] G01B *5/00*

U.S. Cl. 33—520 17 Claims



1. A measuring device, for measuring dimensions of objects, comprising

a guide linkage comprising

a sliding rod,

a coupler having a first sensing element adapted to engage an object to be measured,

a slider slidably mounted on said sliding rod,

two links pivotally connected adjacent respective ends thereof to said slider and to said coupler at respective first pivot points forming at least approximately a parallelogram, and

a crank operatively pivotally connected adjacent respective ends thereof to said sliding rod and to a center of one of said links at respective second pivot points, the crank having a length between said second pivot points equal to half the length of said one link between said first pivot points of said one link;

means comprising an indicator for indicating position of said coupler relative to said sliding rod; and

means for biasing said coupler by spring force in a direction with respect to the object to be measured such that said indicator is responsive to relative movement of said coupler with respect to said sliding rod.

4,711,038

RUN-THROUGH BRICK DRYING PLANT AND METHOD FOR THE CONTROL OF ITS OPERATION

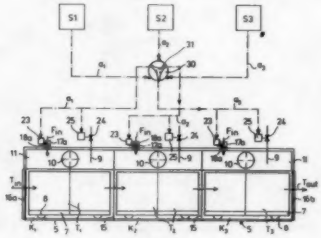
Matti Uimonen, Lahti, Finland, assignor to Tekma Oy, Lahti, Finland

PCT No. PCT/FI83/00072, § 371 Date Jun. 21, 1985, § 102(e) Date Jun. 21, 1985, PCT Pub. No. WO85/02249, PCT Pub. Date May 23, 1985

PCT Filed Nov. 15, 1983, Ser. No. 749,537

Int. Cl.[4] F26B *3/04*

U.S. Cl. 34—25 7 Claims



1. A run-through brick drying apparatus which operates stepwise by the chamber dryer principle comprising a plurality of drying chambers connected in a series with one of said chambers being the first and one being the last drying chamber in said series, a plurality of brick load conveying means, means for moving each conveying means through said chambers, means for controlling the movement of said conveying means pursuant to a selected drying schedule so that, for each conveying means, a selected dwell time in each drying chamber and a selected drying temperature in each chamber is effected whereby drying of each brick load is completed in the last chamber, said conveying means comprising dryer wagons and each said wagon being provided with a vertical wall which functions as a partition wall between said chambers as each said wagon is moved through said chambers.

4,711,039

FLUIDIZED BEDS

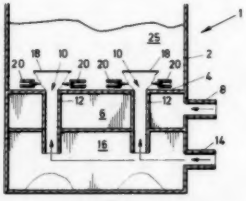
Brian A. Napier, Evesham, and Maurice J. Fisher, Upton upon Severn, both of England, assignors to Coal Industry (Patents) Limited, United Kingdom

Filed Oct. 27, 1986, Ser. No. 923,268

Claims priority, application United Kingdom, Nov. 12, 1985, 8527860

Int. Cl.[4] F26B *17/10*

U.S. Cl. 34—57 A 6 Claims



1. Fluidised bed apparatus including a body adapted to

contain a fluidised bed of particulate material supported by a gas permeable distributor, inlet means for fluidising gas, at least one discharge port means associated with the distributor, a deflector plate disposed in spaced relation above the discharge port means, a gas ejector means associated with the discharge port means, a classifier connected to the discharge port means, and an inlet means to the classifier for classifying air.

4,711,040

APPARATUS FOR CONTINUOUSLY THERMALLY TREATING ELONGATE TEXTILE PRODUCTS

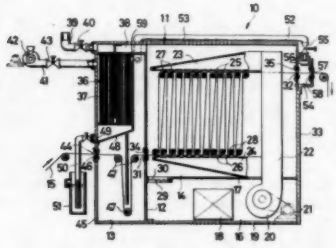
Keizo Hatta, Uozu, Japan, assignor to Yoshid Kogyo K. K., Tokyo, Japan

Filed May 1, 1986, Ser. No. 858,001

Claims priority, application Japan, May 15, 1985, 60-71888[U]; May 17, 1985, 60-73312[U]; May 24, 1985, 60-77369[U]

Int. Cl.⁴ F26B *13/08*

U.S. Cl. 34—73 **10 Claims**



1. An apparatus for continuously thermally treating an elongate textile product having oil, comprising:

(a) a housing having a preheating chamber for preheating the elongate textile product and a main heating chamber for heating the elongate textile product to give off an oily smoke after it has been preheated;

(b) a heat exchanger disposed in said preheating chamber for condensing and collecting solidified tar thereon from the oily smoke;

(c) an outlet tube connected to said heat exchanger for discharging heated oily air from said main heating chamber through said heat exchanger, said outlet tube having a first regulating valve;

(d) an intake tube connected to said heat exchanger for introducing external air through said heat exchanger into said preheating chamber, said intake tube having a second regulating valve; and

(e) a tar collector connected to said heat exchanger for periodically melting and collecting melted tar which flows off said heat exchanger when it is melted by heat produced at an interval of time when said first regulating valve is substantially open and said second regulating valve is closed.

4,711,041

ROTARY DRIER WITH LIFTING ELEMENT

Henrik Ullum, Karlslunde, Denmark, assignor to A/S Atlas, Ballerup, Denmark

PCT No. PCT/DK85/00091, § 371 Date Jun. 20, 1986, § 102(e) Date Jun. 20, 1986, PCT Pub. No. WO86/02150, PCT Pub. Date Apr. 10, 1986

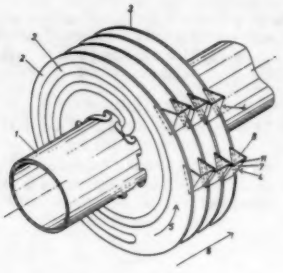
PCT Filed Oct. 2, 1985, Ser. No. 876,883

Claims priority, application Denmark, Oct. 4, 1984, 4753/84

Int. Cl.⁴ F26B *11/04*

U.S. Cl. 34—179 **7 Claims**

1. Drier for the heating and drying of wet, comminuted materials, mainly organic materials, said drier comprising at least a stationary housing with a revolving, hollow rotor with an inlet and outlet for a heating medium, said rotor including a plurality of annular drying elements disposed at intervals therealong and which are heated by the heating medium, at least one lifting element located between and secured to two



adjacent drying elements and spanning same, said lifting elements including at least a pair of securing members secured to and extending generally radially from said lifting element and a support portion bridging said securing members.

4,711,042

CLOSING AND TIGHTENING APPARATUS FOR A REAR-ENTRY SKI BOOT

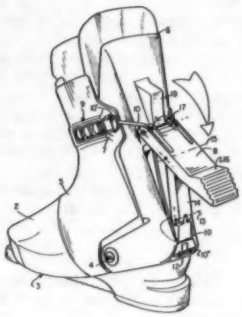
Joseph Morell, Annecy, and Jean-Louis Demarchi, Duingt, both of France, assignors to Salomon S.A., Annecy, France

Filed Sep. 20, 1985, Ser. No. 778,204

Claims priority, application France, Sep. 26, 1984, 84 15260

Int. Cl.⁴ A43B *5/04*; A43C *11/00*

U.S. Cl. 36—50 **74 Claims**



1. An apparatus for closing and tightening a boot on the foot and leg of a skier, wherein said boot comprises a rigid shell base and an upper, wherein said upper comprises first and second parts, wherein said upper is at least partially journalled on said shell base, wherein said first part comprises a cuff and said second part comprises a rear spoiler, wherein one of said parts is journalled relative to said shell base and is pivotable in the longitudinal direction of said boot wherein one of said parts is displaceable with respect to the other of said parts, and wherein said apparatus comprises:

(a) at least one linking element comprising first and second portions, wherein said first portion is attached to said first part of said boot at a first attachment position, wherein said second portion is attached to one of said second part of said boot and said foot of said skier at a second attachment position;

(b) traction means for applying a traction force to said at least one linking element, said traction means being movably mounted relative to the part of said boot on which it is positioned; and

(c) means for changing the direction of said at least one linking element as said least one linking element extends from said first part of said boot around said direction changing means along a second direction to one of said second part of said boot and said foot, wherein said direction changing means is positioned on said traction means intermediate said first and second attachment positions, to direct said linking element along said second direction.

4,711,043

TRAINING DEVICE FOR KICKING A FOOTBALL OR SOCCER BALL

Dennis M. Johnson, 1038 Carrin Dr., and H. Skeet Surrency, 726 E. Jefferson St., both of Tallahassee, Fla. 32301

Filed Oct. 1, 1986, Ser. No. 913,932
Int. Cl.[4] A43B *23/00*
U.S. Cl. 36—139 **1 Claim**

1. An impact audible signal device adapted to be removably attached over the shoe lace of a soccer ball player's shoe, or the like, the combination of:

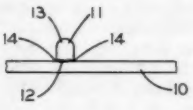
means for generating an audible signal upon impact with a ball; said means being attached to a support material; upper elastic flap means attached to the support material which are adapted to extend behind the ankle of a player and connect by fastening means; a bottom elastic flap means attached to the support material and designed to be wrapped around the bottom lace of a player's shoe and connected by fastening means; said means for generating an audible signal being adjustably secured to a shoe of a player by said upper and bottom flap means so as to position the signal means over the desired area of the shoe.

4,711,044

"NEON LOOK" LIGHTING

Barbara Danjell, Columbus, Ohio, assignor to Danjell Creations, Inc., Columbus, Ohio

Filed Oct. 2, 1985, Ser. No. 782,978
Int. Cl.[4] G09F *13/00*
U.S. Cl. 40—543 **8 Claims**



1. A lighting fixture simulating the appearance of a neon lamp comprising:

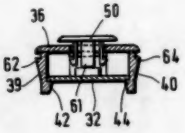
a base panel to which there is applied a three dimensional mass of a fluorescent pigmented cast polymeric material in a predetermined pattern, said mass of pigmented polymeric material simulating a neon glow when activated by an activating lamp, said base panel and said mass of cast polymeric material being further intrinsically adhesively bonded at the interface of the panel and the mass of cast polymeric material, said interface being an abraded area on the base panel corresponding substantially to the predetermined pattern of the mass, and an activating lamp located in a proximate relationship to said panel, whereby the radiation from said lamp is directed to the pattern of the mass of pigmented polymeric material to produce a simulated neon glow.

4,711,045

APPARATUS FOR DOCUMENTLESS ORDER PICKING OF GOODS

Dieter Specht, Wermelskirchen, Fed. Rep. of Germany, assignor to Interroll Fordertechnik GmbH & Co. KG, Wermelskirchen, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,149
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526867
Int. Cl.[4] H01R *33/00*
U.S. Cl. 40—564 **7 Claims**



1. An electronic display and switch apparatus to anable documentless order picking of goods from at least one storage location, said apparatus comprising:

a board having a printed circuit thereon;

a digital luminous display mounted to the board and electrically connected to at least a portion of the circuit thereon;

a cover having a transparent display face and being disposed in snap fit mounting relationship to said board and covering at least the portion of the board to which the digital luminous display is mounted;

a switch mounted to the board and in proximity to the digital luminous display;

an actuator button mounted in snap fit relationship to the cover for limited movement relative thereto, said actuating button being disposed to selectively contact and actuate the switch;

means for snap fitting the cover and the board to the storage location, whereby the digital luminous display may be operated to produce a signal relating to the goods to be picked and whereby the actuating button may be acutated to operate the switch and generate a signal.

4,711,046

LIGHTWEIGHT MULTI-PANEL DISPLAY

Donald E. Herrgord, P.O. Box 1266, Muskegon, Mich. 49443

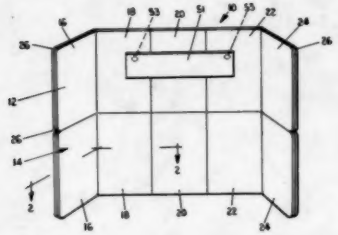
Filed Feb. 27, 1985, Ser. No. 706,107
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—605 **21 Claims**

1. A free standing multi-panel display comprising:

a plurality of panels having front and back surfaces and top, bottom, and side edges, the panels being arranged side-by-side, each panel having longitudinal slots in at least the side edges facing adjacent panels;

pliable strip hinges interconnecting the side edges of adjacent panels, each strip hinge comprising an elongated strip of readily flexible sheet material having side edges that are fastened in slots in the opposing side edges of adjacent panels, leaving a flexible intermediate portion of the strip between the panels that serves as a hinge, the intermediate portion being wide enough to permit adjacent panels to be folded flat against each other in either direction such that either the front or back surfaces of the panel abut each other; and

a display surface formed of flexible sheet material affixed to at least the front surface of the panel display and extending



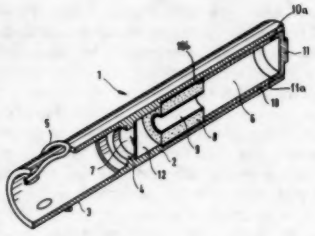
over adjacent panels and their connecting strip hinges so as to form a continuous surface over the multi-panel display.

4,711,047

SIGNAL FLARE CARTRIDGE

Yehuda Meller, Holon, Israel, assignor to The State of Israel, Ministry of Defence, Israel Military Industries, Israel

Filed Aug. 2, 1985, Ser. No. 761,798
Claims priority, application Israel, Jan. 24, 1985, 74148
Int. Cl.[4] F42B *4/26*
U.S. Cl. 42—1.15 **9 Claims**



1. A cartridge unit for producing a flare signal, comprising a launcher tube constituted by a tubular body, means for tightly mounting one end of said tubular body on a barrel of a firearm such that the inner tubular spaces of said barrel and launcher tube are in alignment, a tubular flare body situated entirely within said launcher tube, and means for normally fixing said flare body within said launcher tube, said means including a circumferential annular shoulder formed in an inner surface of said launcher tube and a cylindrical bushing extending axially within said launcher tube having a rear end, said flare body being situated between said shoulder and said rear end of said bushing, said flare body being adapted to enable the unobstructed passage of a bullet from an ammunition round fired by said firearm and to be directly ignited and ejected from said launcher tube by the propellent gases from said fired ammunition.

4,711,048

ANTIPERSONNEL SHOTGUN CHOKE

Clifford L. Ashbrook, P.O. Box 13237, San Antonio, Tex. 78213

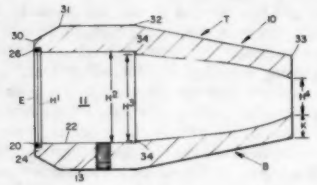
Continuation of Ser. No. 695,096, Jan. 25, 1985. This application Feb. 19, 1987, Ser. No. 18,804
Int. Cl.[4] F41C *21/18*
U.S. Cl. 42—79 **4 Claims**

1. A choke for effecting the projectile path of a plurality of projectiles fired substantially simultaneously from a weapon, comprising:

a tubular member;

the interior surface of said member defining a hollow, interior space through the length of the choke;

the interior surface remaining substantially constant in diameter in a first plane along the length of the choke;



the interior surface remaining substantially constant in diameter over a portion of its length and tapering substantially parabolically over the remainder of its length in a second plane;

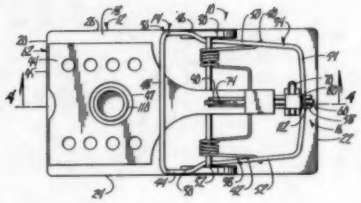
the first plane and the second plane being substantially perpendicular to one another.

4,711,049

ANIMAL TRAP

Lester E. Kness, Granger, Iowa, assignor to Kness Manufacturing Co., Inc., Albia, Iowa

Filed Sep. 25, 1986, Ser. No. 912,789
Int. Cl.[4] A01M *23/30*
U.S. Cl. 43—81 **1 Claim**



1. An animal trap comprising:

a base having an upper surface, opposite sides, and opposite ends;

a jaw frame pivotally mounted on said base for pivotal movement about a horizontal jaw frame axis between a cocked position and a sprung position;

first spring means yieldably urging said jaw frame towards said sprung position;

a catch member pivotally mounted to said base for pivotal movement about a horizontal catch member axis between a catch position and a release position, said catch member having a catch pawl thereon for retentively engaging said jaw frame when said jaw frame and said catch member are in said cocked position and said catch position, respectively, said catch member being pivotal to said release position for moving said catch pawl out of retentive engagement with said jaw frame, thereby freeing said jaw frame for movement to said sprung position;

a trip member pivotally mounted to said base for pivotal movement about a horizontal trip member axis between a set position and a trip position, said trip member having a catch receiving surface;

said catch recieving surface of said trip member retentively engaging said catch member when said catch member and said trip member are in said catch positions and said set positions, respectively;

said catch receiving surface of said trip member moving out of retentive engagement with said catch member whenever said trip member moves to said trip position, thereby freeing said catch member for movement to said release position to permit said jaw frame to move to said sprung position;

said jaw frame engaging said trip member and yieldably holding said trip member in said trip position whenever said jaw frame is in said sprung position, thereby freeing said catch member to move to said release position;

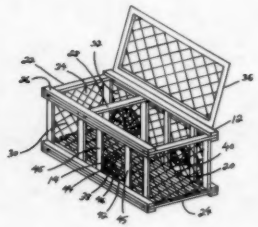
a second spring engaging said trip member and yieldably urging said trip member toward said set position, said second spring comprising a long leg having first and second portions, a cross leg extending perpendicular to said first portion of said long leg, and a short leg extending parallel to and in the same direction as said first portion of said long leg, said second portion of said long leg extending upwardly and engaging said trip member and yieldably urging said trip member toward said set position with a force which is less than and yieldable in response to the force exerted by said jaw frame on said trip member when said jaw frame is in said sprung position.

4,711,050

LOBSTER POT

Thomas C. Galgana, Quincy, Mass., assignor to Wilfred Norris, Plymouth, Mass.

Filed Apr. 7, 1986, Ser. No. 849,022
Int. Cl.[4] A01K *71/00*
U.S. Cl. 43—102 **6 Claims**



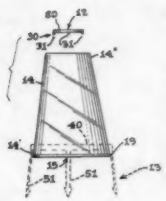
1. A lobster pot comprising a unitary plastic kitchen head, a unitary plastic parlor head and a housing, the parlor head mounted completely within the housing, the kitchen head is generally frustoconical in configuration and includes an entry collar, an exit collar and a side, the side having a first end and a second end, the exit collar integral with the first end and the entry collar integral with the second end, the parlor head is generally frustoconical in configuration and includes an entrance collar, an egress collar and a side, the side having a first end and a second end, the egress collar integral with the first end and the entrance collar integral with the second end, the housing including a plastic lath frame, a series of wire mesh sections and the kitchen head being attached to a wire mesh section, the plastic lath frames providing a pair of top channel members and a pair of bottom channel members, each of the top and bottom channel members being configured as a rectangular strip having a first support face formed on one long side and a second support face formed on another long side in right angle relation to the first long side and having a first terminal end and a second terminal end, each of the first support faces having a centrally positioned, longitudinally extending first side mesh support channel formed therein and each of the second support faces having a centrally positioned, longitudinally extending second mesh support channel formed therein whereby the sections of wire mesh are adapted to be engaged within the first and second side mesh support channels.

4,711,051

NESTABLE MINI-GREENHOUSE APPARATUS

Sachi M. Fujimoto, 901 Raton Ave., La Junta, Colo. 81050

Filed Nov. 4, 1986, Ser. No. 926,743
Int. Cl.[4] A01G *9/00*
U.S. Cl. 47—17 **3 Claims**



1. A mini-greenhouse apparatus for use in both an indoor environment with potted plants and an outdoor environment with fertile garden soil; wherein, the apparatus consists of:

a receptacle unit comprising a tapered receptacle member having an enlarged opening formed on one end, and an enlarged central aperture formed on its other end; wherein, said one end of said tapered receptacle comprises the larger end which is further provided with an outwardly projecting lip element which surrounds the enlarged opening; and, said other end of said tapered receptacle member comprises the smaller end which is provided with a shoulder element which surrounds the enlarged central aperture, wherein said shoulder element is further provided with a plurality of smaller apertures which surround the periphery of said enlarged central aperture;

a cap unit comprising a cap member having a diameter that is greater than the diameter of said enlarged central aperture on the smaller end of the receptacle member; wherein the cap member is provided with a plurality of deformable stem elements which are dimensioned to cooperate with said plurality of apertures on the shoulder element of the receptacle member; whereby, the cap unit may be disposed with respect to the enlarged central aperture in the receptacle member in a selected one of the following modes of disposition: totally disengaged partially engaged; and, fully engaged; and,

an anchor unit comprising a collar element provided with a plurality of downwardly depending ground penetrating spike elements; wherein, the inside diameter of said collar element is approximately equal to, but less than, the outside diameter of the lip element on said receptacle member; whereby, the anchor unit may optionally engage the collar element of said receptacle unit in either a ground penetrating mode or a storage mode.

4,711,052

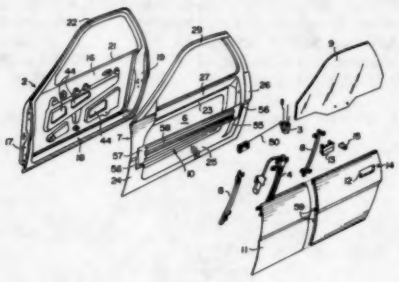
VEHICLE DOOR STRUCTURE

Tatsuo Maeda, and Takeji Ohya, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Dec. 3, 1986, Ser. No. 937,543
Claims priority, application Japan, Dec. 5, 1985, 60-274418
Int. Cl.[4] B60J *5/04*
U.S. Cl. 49—502 **16 Claims**

1. A vehicle door structure comprising an inner panel on which functional parts are to be mounted, and an outer panel having a central opening, the inner panel and the outer panel being lap-bonded together at the front edge, the bottom edge and the rear edge, the portion of the outer panel surrounding

the central opening being bonded to the inner panel, at least front and rear edge portions of the door body being formed of

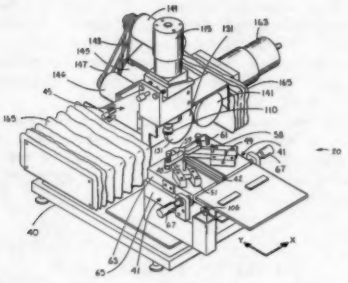


closed cross-section portions, and the outer side of the outer panel being covered with an outer plate of synthetic resin.

4,711,053
APPARATUS FOR END FINISHING A LIGHTGUIDE FIBER TERMINATION

Donald Q. Snyder, Marietta, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 793,948, Nov. 1, 1985, Pat. No. 4,649,670, which is a continuation of Ser. No. 496,163, May 19, 1983, abandoned. This application Oct. 31, 1986, Ser. No. 925,575
Int. Cl.[4] B24B *13/00*
U.S. Cl. 51—3 **11 Claims**



1. An apparatus for preparing an assembly, which includes at least one lightguide fiber and a terminator, for connection with another assembly, said apparatus comprising:

nest means for holding the assembly in a position along a reference axis with a length of the fiber which is disposed within the terminator being parallel to the axis;

a first tool which is adapted to provide the assembly with an end portion having a predetermined profile;

moving means for causing relative motion between the assembly and the first tool along a path of travel which is normal to the reference axis;

means for controlling the first tool to remove portions of the terminator and of the fiber to provide the assembly with the end portion having the predetermined profile;

means for preventing movement of the assembly along the reference axis during the formation of the end portion having the predetermined profile and for then releasing the assembly for movement along the axis;

a second tool which is adapted to finish a surface of the end portion and an end of the fiber which terminates in the surface;

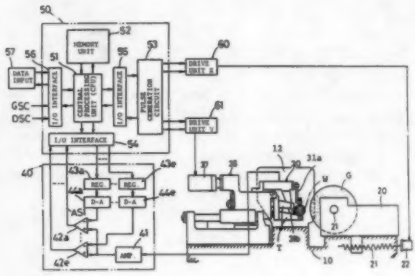
means for applying resilient biasing forces to the assembly to hold the surface of the end portion in engagement with said second tool to provide a controlled pressure between the surface and said second tool; and

means for causing relative motion between the assembly and said second tool in a direction normal to the reference axis to allow the second tool to finish the surface of the end portion and the end of the fiber.

4,711,054
GRINDING MACHINE WITH A STEADY REST

Toshio Tsujiuchi; Yoshinori Shinmura, and Yukio Oda, all of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 30, 1986, Ser. No. 924,777
Claims priority, application Japan, Nov. 4, 1985, 60-247816
Int. Cl.[4] B24B *49/02*
U.S. Cl. 51—165.77 **6 Claims**



1. A grinding machine wherein a sizing device is provided for outputting a sizing signal when a cylindrical workpiece is ground to a set size, and wherein in response to said sizing signal from said sizing device, the infeed movement of a wheel head rotatably carrying a grinding wheel is halted and the feed movement of a jaw of a steady rest is started to infeed said workpiece against said grinding wheel, the improvement comprising:

register means for storing said set size;

initial size setting means operable each time said grinding wheel is trued, for setting in said register means an initial set size larger than a theoretical size which determines the time point to output said sizing signal;

size modification means for diminishing said initial set size stored in said register means, gradually with the increase in number of workpieces ground by said grinding wheel; and

comparison means responsive to said set size stored in said register means for generating said sizing signal when said workpiece is ground to said set size stored in said register means.

4,711,055
DISPLACEABLE PROTECTIVE COVER FOR HANDTOOLS PROVIDED WITH ROTATABLE DISC-SHAPED TOOLS

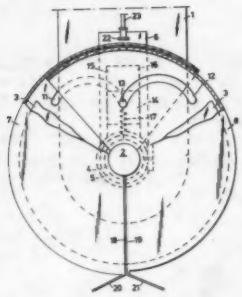
Kaj Mickos, Prinsvagen 10, S-131 46 Nacka, Sweden

PCT No. PCT/SE86/00068, § 371 Date Sep. 22, 1986, § 102(e) Date Sep. 22, 1986, PCT Pub. No. WO86/04855, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 18, 1986, Ser. No. 909,578
Claims priority, application Sweden, Feb. 25, 1985, 8500931
Int. Cl.[4] B24B *55/04*
U.S. Cl. 51—268 **3 Claims**

1. A rotatably displaceable protective cover for a handtool having a driven shaft and a disc-shaped tool mounted on the driven shaft for rotation therewith,

said protective cover including a pair of telescoping cover-

halves mounted for rotation about the driven shaft from a fully closed position in which they fully enclose the disc-shaped tool to an open position where the cover-halves telescope inside each other to expose the disc-shaped tool,



means to prevent one cover-half from opening substantially more than the other cover-half when a force is applied to only one of the cover-halves, while permitting the cover-halves to open by telescoping into each other in a synchronized rotational movement when substantially equal forces are applied to each cover-half.

4,711,056

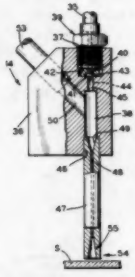
ABRASIVE FLUID JET RADIUS EDGE CUTTING OF GLASS

Richard A. Herrington, Walbridge; Thomas G. Kleman, Graytown, and Ermelinda A. Apolinar, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Continuation of Ser. No. 776,377, Sep. 16, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 930,957

Int. Cl.[4] B24C *5/04, 1/00*

U.S. Cl. 51—410 **19 Claims**



1. A method of forming a rounded edge in cutting a glass sheet along a desired path with an abrasive liquid jet, comprising advancing the liquid jet in which abrasive particles are entrained through an elongated cylindrical passageway to collimate said liquid jet, discharging said collimated liquid jet closely adjacent said sheet, allowing said liquid jet to diverge within confined limits immediately prior to being discharged against said sheet, the distance said liquid jet travels through said cylindrical passageway being at least two and one-half times the distance traversed in diverging within confined limits, and moving said liquid jet and said sheet relative to one another along the desired path for the cut.

4,711,057

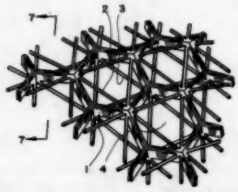
SUBASSEMBLY FOR GEODESICALLY REINFORCED HONEYCOMB STRUCTURES

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, Woody Creek, Colo., assignors to Jung G. Lew and Hyok S. Lew, both of Arvada, Colo.

Continuation-in-part of Ser. No. 682,675, Dec. 17, 1984, Pat. No. 4,603,519. This application Aug. 4, 1986, Ser. No. 892,592

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—81 **20 Claims**



1. A subassembly for geodesically reinforced honeycomb structure comprising in combination:

(a) one or more elongated structural members capable of bearing a shearing force and bending moment arranged into a hexagonal assembly;

(b) one or more elongated structural members capable of bearing an axial loading arranged into a first triangular assembly disposed within said hexagonal assembly wherein each corner of said first triangular assembly is connected to each alternating corner of said hexagonal assembly;

(c) one or more elongated structural members capable of bearing an axial loading arranged into a second triangular assembly disposed within said hexagonal assembly wherein each corner of said second triangular assembly is connected to each alternating corner of said hexagonal assembly, said alternating corner being different from the corners of said hexagonal assembly connected to corners of said first triangular assembly; and

(d) means included in said hexagonal assembly for accommodating connection means for connecting said hexagonal assembly to other hexagonal assemblies included in adjacent subassemblies to form a geodesically reinforced honeycomb structure.

4,711,058

INSULATED CONCRETE FORM

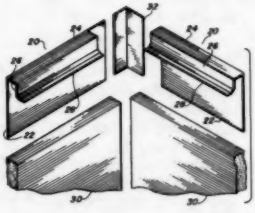
Edward J. Patton, Murrieta, Calif., assignor to Ahamco Investments, Inc., Rancho California, Calif.

PCT No. PCT/US84/00924, § 371 Date Feb. 6, 1986, § 102(e) Date Feb. 6, 1986, PCT Pub. No. WO86/00101, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 11, 1984, Ser. No. 864,999

Int. Cl.[4] E04B *1/72*

U.S. Cl. 52—101 **3 Claims**



1. An insulated concrete form for slab flooring comprising:

(a) a metallic protective sheath in linear form having a verti-

cal front leg, a horizontal top, a vertical back, and an angular locking flange and bug barrier;

(b) an insulated barrier of rigid block foam in linear rectangular shape having a front, back, top, and bottom, partially contiguous on the front with said sheath vertical front leg, the top contiguous with said sheath horizontal top, and the upper portion of the back contiguous with said sheath vertical back, all being in intimate contact;

(c) adhesive bonding said protective sheath to said insulated barrier in constant relationship defining a self-contained permanent form to receive concrete in the liquified state when poured into a slab floor configuration becoming an integral part of the periphery when the concrete is solidified with said angular locking flange and bug barrier secured within the concrete and the top planar with the horizontal surface of the slab; and,

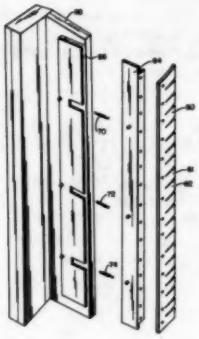
(d) an angular corner formed by notching said sheath horizontal top, vertical back, and angular locking flange of one linear form in such a manner as to abut with an unnotched form at right angles having said sheath covering the entire corner without overlapping or exposing said insulated barrier.

4,711,059

DOCK SEAL WITH LIP FOR SEALING DOOR HINGE GAP

Richard C. Layne, Columbus, Ohio, assignor to Gladys M. Sahr, Columbus, Ohio

Filed Mar. 11, 1985, Ser. No. 710,490
Int. Cl.[4] E04H *14/00*
U.S. Cl. 52—173 DS **8 Claims**



1. An improved dock seal or shelter for sealing between a dock opening and a truck body and for sealing a space between an opened rear truck door and the door frame of the truck body, the seal being of the type having a movable panel which, in its disengaged position, extends generally toward the center of the dock opening and is movable back toward the opening upon engagement against the exterior of a truck, wherein the improvement comprises:

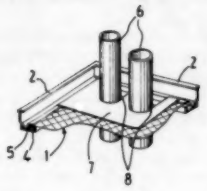
a generally vertically straight, elongated lip panel means attached to the movable panel near and running along its inner edge and, in said disengaged position, extending generally away from the dock opening, for being deflected into contacting and sealing engagement against the space between an opened truck door and the truck body by the movement of the truck body against the movable panel and the lip panel.

4,711,060

FALSE CEILING OR FALSE WALL CONSTITUTED BY A STRETCHED SHEET FASTENED

Fernand Scherrer, 2, rue Georges Bizet, 68170 Rixheim, France

Filed Sep. 9, 1986, Ser. No. 905,781
Claims priority, application France, Sep. 13, 1985, 85 13620
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—222 **12 Claims**



1. A false ceiling or false wall assembly for a room, comprising:

a frame adapted to be secured to said ceiling or wall, said frame extending all around said room, said frame comprising a horizontal member having a horizontal terminal shoulder;

a sheet having edges secured to said frame, said edges having along at least part of their length hook-shaped terminal portions secured to said shoulder to stretch said sheet in said frame;

at least one opening in said sheet extending toward said frame to allow passage therein of a duct; and

a reinforcing plate fixed on the top of said sheet;

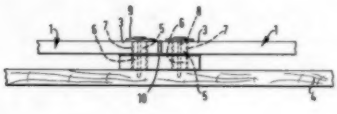
said plate having an opening superimposed on said sheet opening in registry therewith and having at least a terminal portion thereof on said sheet over said shoulder of said frame.

4,711,061

ROOF AND A METHOD OF PROVIDING A BUILDING WITH A ROOF

John Wilkinson, Dursley, and Nicholas Holbrook, Camberley, both of United Kingdom, assignors to Jacqueline M. Ashfield and Michele Ashfield, both of Bristol, United Kingdom

Filed Nov. 19, 1985, Ser. No. 799,431
Claims priority, application United Kingdom, Nov. 19, 1984, 8429194; Aug. 14, 1985, 8520339
Int. Cl.[4] E04B *7/00, 1/66*
U.S. Cl. 52—410 **5 Claims**



1. A roof, or a portion of a roof, resiliently securable to a substructure of a building, the roof or roof portion comprising:

a panel;

a strip which is overlapped by and supports the panel along at least a portion of the edge regions thereof;

respective fixing means, each extending through a respective aperture in the panel and a corresponding respective aperture in the strip to secure the roof, or the roof portion, to the substructure of the building whilst permitting relative movement between the panel, strip and substructure;

an intermediate layer of a resilient sealing material which spaces the panel from the strip such that the panel is capable of relative movement with respect to the strip whilst sealing the panel with respect to the strip, the resilient

sealing material being chosen from those materials which are liquid before assembly of the roof and which are capable of setting, after assembly of the roof, to provide the intermediate layer;

an array of said panels, each panel being resiliently secured to an adjacent panel of the array along their adjacent edge regions;

at least one strip which is overlapped by, and is fixed to, said adjacent edge regions to secure the adjacent panels together;

a plurality of fixing means, each extending through a respective aperture in the panel and a corresponding respective aperture in the strip to secure the roof, or the roof portion, to the substructure of the building whilst permitting relative movement between the panels, the at least one strip and substructure;

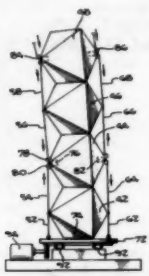
wherein the at least one strip, the edge regions of the panels which overlap the at least one strip, and adjacent edges of the panel are spaced-apart by an intermediate layer of a resilient sealing material, the resilient sealing material being chosen from those materials which are liquid before assembly of the roof and which are capable of setting, after assembly of the roof, to provide the intermediate layer; and wherein the panels are capable of relative movement with respect to each other and with respect to the at least one strip, whilst a seal is provided between those components between which there may be relative movement, and wherein a sleeve is aligned in the said apertures and each fixing means extends through a respective sleeve.

4,711,062

OCTET STRUCTURES USING TENSION AND COMPRESSION

Tony S. Gwilliam, 151 N. Alvarado, Ojai, Calif. 93023, and Russell Ohu, 2400 Beverly Ave., #18, Santa Monica, Calif. 90405

Filed Dec. 17, 1986, Ser. No. 943,559
Int. Cl.[4] E04H *12/18*
U.S. Cl. 52—646 **20 Claims**



1. An octet structure having a high strength-to-weight ratio comprising:

a plurality of octahedral modules, each including three compression struts and a plurality of flexible tension members interconnecting the ends of said struts;

means for joining a plurality of said octahedral modules along edges thereof shared in common by at least two of said modules; and

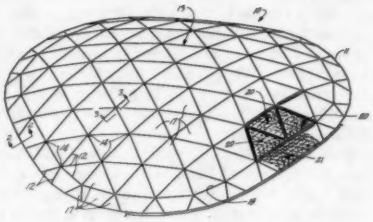
means including additional flexible tension members forming tetrahedral cells adjacent said octahedral modules.

4,711,063

LARGE SPAN DOME

Donald L. Richter, Rolling Hills Estates, Calif., assignor to Temcor, Torrance, Calif.

Division of Ser. No. 730,164, May 3, 1985, Pat. No. 4,611,442.
This application Apr. 16, 1986, Ser. No. 852,561
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—741 **6 Claims**



1. A method of erecting a large clear-span dome structure over a space having a perimeter of selected planform configuration, such as the space within an athletic stadium, the method comprising the steps of:

A. providing horizontal and vertical load supporting means along the perimeter;

B. spanning the space by interconnecting between the supporting means a principal network of structural members which define a principal dome curvature, and subdividing the principal curvature into a plurality of openings in the network;

C. closing each said opening with a secondary dome structure having a curvature substantially greater than the principal dome curvature; and

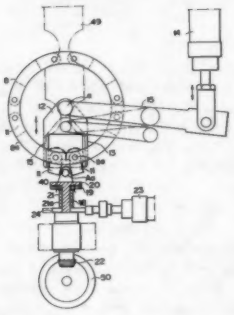
D. connecting each secondary dome structure substantially along the perimeter thereof to the network for transfer of forces developed in the secondary dome due to its own structure and of loads applied to it to the network members and across the network members to adjacent secondary dome structures.

4,711,064

BINDING APPARATUS FOR SEALING BAGS OR THE LIKE

Masaaki Tsuda, Yokohama, Japan, assignor to Kabushiki Kaisha Takara, Osaka, Japan

Filed Jan. 27, 1987, Ser. No. 7,112
Claims priority, application Japan, Sep. 17, 1986, 61-219055
Int. Cl.[4] B65B *51/08*
U.S. Cl. 53—137 **4 Claims**



1. A binding apparatus for sealing the bags or the like, comprising:

bag carrying/gathering means composed of a pair of intermittently moving chains each having pushers disposed as regularly spaced and projecting thereon and which are disposed parallelly to a bag carrying conveyor;

tie delivering means having a drum located right above said bag neck gathering position and on the outer circumference of which disposed are stationary gather receivers and moving tie keep pins, and a pair of swing levers to bend the tie into a reversed U-shape at the body of said drum;

a pushing member having legs to push down directly said swing levers provided within said drum, and a tie cutter of which the end is forced to the outer circumferential surface of the drum to cut the tie; and

tie twisting means to catch and twist the tie placed right below said tie delivering means and also below said bag neck carrying means.

4,711,065

APPARATUS FOR PRODUCING PACKS, ESPECIALLY CIGARETTE CARTONS

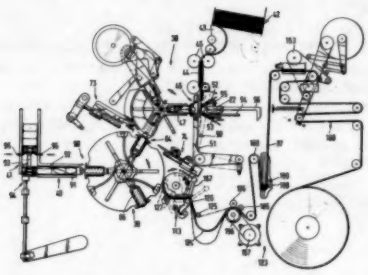
Heinz Focke; Horst Langer, both of Verden, and Hans-Jürgen Bretthauer, Bremen, all of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH), Verden, Fed. Rep. of Germany

Continuation of Ser. No. 649,024, Sep. 10, 1984, abandoned. This application May 22, 1986, Ser. No. 868,155

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333053

Int. Cl.[4] B65B *11/32*

U.S. Cl. 53—170 **17 Claims**



1. An apparatus for selectively wrapping packs (22) in at least one of two blanks (23, 24) and for discharging said packs wrapped in only a first blank, in only a second blank, or in both said first and second blanks, comprising:

first (38) and second (39) wrapping turrets arranged one above the other with their rotational axies parallel to each other all of said packs passing through both of said first and second wrapping turrets;

each of said wrapping turrets including only three pockets (47, 65), each of said pockets being open at an end thereof to receive one pack (22);

means for synchronously rotating said first and second turrets in the same direction;

feeding means including a transfer station (64) between the two turrtes for feeding all of said packs to be wrapped either in the first, the second, or both of said blanks first through said first turrets, then through said transfer station (64) and then through said second turret, said feeding means including means for pushing a pack (22) in a pocket (47) of said first turret out of said first turret pocket and directly into a pocket (65) of said second turret;

first supply means (42) for selectively supplying said first blanks (23) to said first turret;

second supply means (123) for selectively supplying said said second blanks (24) to said second turret; and

a sole discharge means (40, 41) fixedly arranged to receive only packs discharged from said second turret wrapped only in said first blank, only ;n said second blank, or in both said first and second blanks depending upon which of said supply means have supplied blanks to their respective turrets.

4,711,066

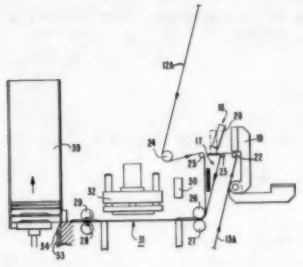
METHOD AND APPARATUS FOR PACKAGING MEDICAL GAUZE SPONGES

Lester A. Fox, and Paul E. Zielinski, both of Augusta, Ga., assignors to The Surgimach Corporation, Augusta, Ga.

Filed Sep. 9, 1986, Ser. No. 905,130

Int. Cl.[4] B65B *9/02, 35/50, 63/02*

U.S. Cl. 53—436 **11 Claims**



1. The method of manufacturing packaged deformable articles of a shape in which the articles have major faces that are generally disposed in a flat plane with a stacked array thereof contained between two webs of packaging material, comprising the steps of:

forming the articles in a machine,

delivering a fixed number of at least two of the articles from the machine in a stacked array with major faces of the articles vertically disposed in a side-by-side, contacting relationship,

converging two webs of the packaging material into a substantially V-shaped, vertically disposed reception slot defining a pocket open in an upward direction and adapted to receive the stacked array,

dropping the stacked array vertically downwardly into the reception slot so that the stacked array is substantially wedged therebetween,

synchronously moving the webs of packaging material as the stacked array is received thereinto for moving the stacked array away from said slot while the array is between the webs and for containing and holding said stacked array as a unit,

sealing the webs together about the stacked array therebetween to form a sealed package, and

separating the sealed webs between successive stacked arrays to form individual sealed packages containing a plurality of the deformable articles in side-by-side relationship.

4,711,067

METHOD OF PACKAGING A SINGLE MATTRESS TO A SMALL SIZE TO BE CONVENIENTLY CARRIED

Giuliano Magni, Roma 512-Fontanell, Prato, Firenze, Italy (50047), assignor to Giuliano Magni and Dino-Franco Magni, both of Prato, Italy

Continuation-in-part of Ser. No. 576,709, Feb. 3, 1984, abandoned. This application Apr. 16, 1985, Ser. No. 724,034

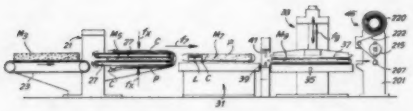
The portion of the term of this patent subsequent to Dec. 8, 2002, has been disclaimed.

Int. Cl.[4] B65B *63/02*

U.S. Cl. 53—439 **13 Claims**

1. A method of individually forming and packaging a mattress, including the steps of:

reducing the thickness of an elastic structure of the mattress by pressing and feeding means cantileverly projecting;
fitting a cover on said structure and on said pressing means to complete the mattress, said cover comprising foam padding with inside film and a closure means;
fitting a flexible and substantially air-tight wrapper on the outside of said cover;
moving away the mattress with said cover and said wrapper from said pressing and feeding means;
closing the cover by said closure means;
flattening the mattress together with its cover and the flexible wrapper;
engaging a ribbon-shaped film to a rolling-up mandrel arranged to cooperate with a cylinder operating the compression by rolling and being elastically pushed toward said mandrel;



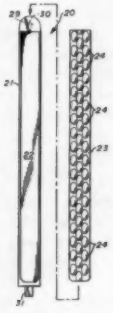
inserting the flattened mattress between said mandrel and said compressing cylinder;
rotating said mandrel and rolling up on said mandrel said ribbon-shaped film and said flattened mattress by compressing it by means of said cylinder which performs compression by rolling;
continuing the rolling up of said ribbon-shaped film for at least a convolution around the mattress being rolled-up on the mandrel and cutting said film;
circularly applying at least two adhesive ribbon-shaped strings at spaced apart positions on said at least one convolution of ribbon-shaped film around the rolled mattress in order to stabilize it;
axially withdrawing the mandrel from the rolled mattress and putting said mattress in a box-like container.

4,711,068

PACKAGING MACHINES AND WEAR STRIPS THEREFOR

Ben Dominguez, Pasadena, Tex., assignor to Formers of Houston, Inc., Pasadena, Tex.

Filed Dec. 4, 1986, Ser. No. 938,044
Int. Cl.[4] B65B *9/08, 9/12*
U.S. Cl. 53—551 **24 Claims**



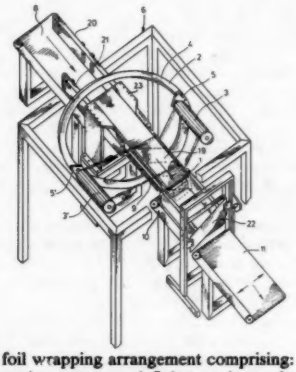
1. In a form, fill and seal packaging machine comprising;
a source of flexible packaging material in the form of a rolled elongated strip of packaging material,
a tube former adapted to receive said strip material and progressively form the same to a depending and upwardly open tubular configuration, opposite longitudinal edge portions of the material being progressively juxtaposed by said former in parallel vertically extending relationship, a tubular fill pipe associated with said former and depending therefrom, the formed tubular configuration surrounding the exterior surface and through which measured quantities of product are passed,
product dispensing means associated with said former and operable for the gravity discharge of measured quantities of product through said fill pipe to the formed tube interior through its upwardly open end,
longitudinal seam sealing means disposed beneath said former adjacent said fill pipe and movable relative thereto into and out of sealing engagement with the juxtaposed edge portions of the tubular configuration,
intermittently operable tube advancing means adjacent said wear means cooperative therewith to draw said tube downwardly therebetween whereby successively to present integral blanks in tubular form at said longitudinal seam sealing means, and
end sealing means disposed beneath said fill pipe and operable intermittently to seal transversely end portions of said tubular blanks whereby to form product bearing packages,
the combination with said fill pipe of wear means completely overlying and removably secured on the outer surface of said fill pipe across which the interior surface of the surrounding formed tubular configuration passes in frictional contact therewith and inclusing means to secure said wear means to said pipe.

4,711,069

STRETCH FOIL WRAPPING ARRANGEMENT

Peter Silbernagel, Ochtrup, Fed. Rep. of Germany, assignor to B. Hagemann & Co., Steinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 663,392, Oct. 22, 1984, abandoned.
This application Jul. 25, 1986, Ser. No. 889,590
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338036
Int. Cl.[4] B65B *53/00*
U.S. Cl. 53—556 **13 Claims**



1. A stretch foil wrapping arrangement comprising:
a wrapping station structure defining a place whereat an object is to be wrapped with a stretch foil;
belt feeder means for conveying said object to said wrapping station;
a transition bridge for receiving said object from said belt feeder means and conveying it through said wrapping station, said transition bridge including first and second transition conveyors positioned so as to be substantially parallel to one another, each transition conveyor including an internal roller plane having an inner portion or an internal roller plane of the other transition conveyor, and an external belt located on a side of each of said first and

second transition conveyors opposite said inner portion of said internal roller plane, each said roller plane being adapted to permit the conveyance of said object;

means for wrapping stretch foil around said transition bridge and said external belts associated therewith so as to form a continuous tube of foil;

means for driving said external belts;

said object being conveyed with said tube by edgewise contact with said continuous tube of foil; and

a cutting station, positioned substantially adjacent to said transition bridge, for receiving said continuous tube with said object therein and cutting said tube, the stretch foil then adhering closely to said object.

4,711,070

BAG PACKAGING MACHINE AND METHOD

Andre Massa, Mions, and Guy Dupasquier, Villeurbanne, both of France, assignors to Atochem, France

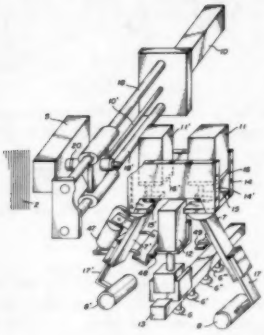
PCT No. PCT/FR85/00219, § 371 Date Jun. 23, 1986, § 102(e) Date Jun. 23, 1986, PCT Pub. No. WO86/01486, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 13, 1985, Ser. No. 870,279

Claims priority, application France, Aug. 22, 1984, 84 13055

Int. Cl.⁴ B65B *43/30*

U.S. Cl. 53—573 **12 Claims**



1. In a machine having a fixed portion and fitted with at least one pneumatic cylinder and piston, which cylinder and piston is activated by a nominal-pressure supply and forms part of a subassembly which moves with respect to said fixed portion of the machine, the improvement comprising;

(a) a counter-pressure system for each working phase of said at least one cylinder and piston of said moving subassembly, including means for counter-acting the nominal-pressure supply to said subassembly cylinder to reduce jerking movements thereof during operation;

(b) a speed-control unit for providing said nominal-pressure to said subassembly cylinder having a variable throttling valve and an anti-return valve for said subassembly cylinder, which speed-control unit is affixed to said fixed portion of said machine separate from said subassembly; and

(c) flexible lines between said subassembly cylinder and said speed-control unit, thereby reducing the mass of said moving subassembly to further reduce jerking movements thereof during operation.

4,711,071

APPARATUS TO STRAP A TAPE AROUND AN OBJECT

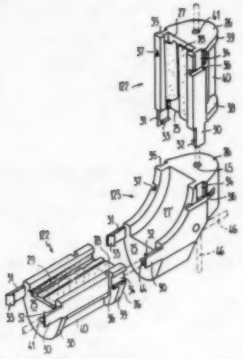
Bruno Kägi, Uezwil, Switzerland, assignor to Strapex AG, Switzerland

Filed Nov. 6, 1986, Ser. No. 927,642

Claims priority, application Switzerland, Nov. 6, 1985, 4769/85

Int. Cl.⁴ B65B *13/06*

U.S. Cl. 53—589 **10 Claims**



1. In an apparatus for strapping objects with a tape, disposed to bridge in the manner of an arch an object to be taped, for guiding the tape around the object as the tape is advanced and releasing the tape when the tape is tensioned and clamped around the object, a tape guidance duct, comprising:

a detachably linked sequence of tape guidance segments, including rectilinear segments and arcuate segments, each of said guidance segments having a monolithic structure of a plastics material formed to provide a low-friction passage for the tape, each of said guidance segments also being formed to have at a first end two integral arms projecting beyond the first end, each of the arms comprising a snap-in tooth, and two recessed clearances extending from a second end toward the first end, such that each two neighboring guidance segments in the linked sequence under external force engage each other securely with the arms of one segment spreading to slide along corresponding recesses of the other until the snap-in teeth fully engage therein and said two neighboring segments butt together with firm contact at end faces formed orthogonal to the direction in which the guided tape advances around the object, wherein the cross-section of said tape passage through each of said rectilinear segments reduces in width and height to form a narrowing tapered passage in the direction of tape advance.

4,711,072

GRASS CUTTING ATTACHMENT FOR TRACTOR

Edward J. Aldred, Ipswich, England, assignor to Ransomes Sims & Jefferies PLC, Ipswich, England

Filed Jan. 17, 1986, Ser. No. 819,852

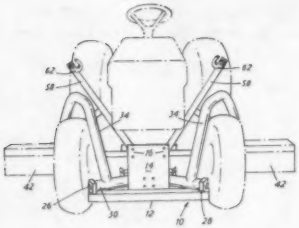
Claims priority, application United Kingdom, Jan. 18, 1985, 8501269

Int. Cl.⁴ A01D *34/24, 34/06*

U.S. Cl. 56—6 **10 Claims**

1. A grass cutting attachment comprising a frame adapted for fixed mounting to a tractor with a frame part positioned fowardly of the tractor front axle; two support arms each pivotally mounted at one end thereof to the frame part at a location therein forwardly of the tractor front axle and carrying at the other end a cutting unit, the support arms extending rearwardly past the tractor front axle to position the associated

cutting units between front and rear tractor wheels, the arrangement being such that pivotal movement of each support



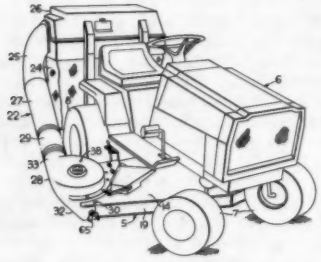
arm relative to the frame effects bodily movement of the associated cutting unit from the ground.

4,711,073

CLIPPING PROPULSION MEANS FOR TRACTOR MOWER

Edward Freier, Jr., and Daniel W. Schaefer, both of Port Washington, Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Jun. 30, 1986, Ser. No. 880,204
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—13.3 **9 Claims**



1. Mowing apparatus comprising a riding vehicle, a mower carried by said vehicle that comprises a mower housing having a top wall and having at one side thereof a clipping outlet that lies substantially in a vertical plane, and at least one cutting blade rotatable in a disc-like blade orbit about an upright blade axis which is so spaced in an inward direction from said plane that said blade orbit is substantially wholly within the housing and has a portion adjacent to said plane, a clipping receptacle near a rear end of the vehicle, a clipping duct for conducting clippings from the clipping outlet to the receptacle, and impeller means for propelling clippings along said clipping duct, said mowing apparatus being characterized by:

A. said clipping duct having a front section that defines a passage
  (1) which extends upwardly and rearwardly from said clipping outlet and
  (2) a portion or which is spaced from said plane in the direction away from said blade axis and is above the level of said top wall of the mower housing;

B. said impeller means comprising
  (1) a rotor having
    (a) a rotor axis and
    (b) a plurality of vanes, each of which has a tip portion that extends edgewise substantially radially and parallel to said rotor axis, said vanes being rotatable about said rotor axis for movement of their tip portions in a vane orbit,
  (2) means rotatably mounting said rotor above the top wall of the housing with the rotor axis
    (a) upright and
    (b) so located between said plane and said blade axis that
      (i) one portion of said vane orbit is in said portion of said passage and
      (ii) a substantially opposite portion of said vane orbit overlies said portion of said blade orbit, and
  (3) an impeller housing above said top wall of the mower housing, defining a chamber which surrounds said substantially opposite portion of the vane orbit and which opens to said passage to cooperate therewith in enclosing the rotor; and

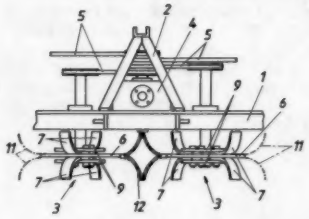
C. drive means for rotating the rotor in the direction such that the tip portions of its vanes move substantially rearwardly in said one portion of the vane orbit.

4,711,074

MOWING AND CHOPPING MACHINE

Franz Jetzinger, Schindau 31, A-3364 Neuhofen, a.d. Ybbs, Austria

Filed Feb. 11, 1986, Ser. No. 828,640
Int. Cl.[4] A01D *34/66, 34/73*
U.S. Cl. 56—13.6 **18 Claims**



1. A mowing and chopping machine comprising

(a) a frame adapted to travel in a predetermined direction of travel over a crop to be mowed,

(b) two rotors mounted in said frame for rotation in opposite directions about respective vertical axes, the vertical axes being spaced apart transversely to said direction of travel, and each of said rotors comprising
  (1) a cutting tooth-carrying disc extending in a horizontal plane common to said discs,
  (2) two additional discs coaxial with, and vertically spaced apart from said tooth-carrying disc, the additional discs being disposed above and below an upper side and an underside of said tooth-carrying disc, respectively,
  (3) a first set of angularly spaced apart cutting teeth having a radially inner portion and a portion protruding from the periphery of the discs downwardly curved below said common plane, the inner portions of the teeth being pivoted to said tooth-carrying disc by vertical pins and extending between, and being in sliding contact with, the underside of said tooth-carrying disc and an adjacent one of said additional discs,
  (4) a second set of angularly spaced apart cutting teeth having a radially inner portion and a portion protruding from the periphery of the discs upwardly curved above said common plane, the inner portions of the teeth being pivoted to said tooth-carrying disc by vertical pins and extending between, and being in sliding contact with, the upper side of said tooth-carrying disc and an adjacent one of said additional discs, and
  (5) said rotors being rotatable about said vertical axes and said rotors and cutting teeth being so arranged that said cutting teeth describe respective flight paths closely spaced apart in a vertical projection and defining therebetween a space of generally triangular horizontal cross

section, said space trailing a like space between the flight paths in the directions of rotation of the rotors, and

(c) a backing cutter fixed to said frame and disposed in said trailing triangular space, the backing cutter having

(1) at least four knife edges adapted to cooperate with said cutting teeth.

4,711,075

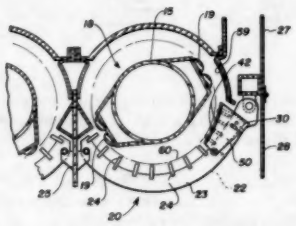
INTEGRALLY MOUNTED POSITIONABLE CONCAVE EXTENSION

Russell W. Strong, Brugge, Belgium, assignor to New Holland Inc., New Holland, Pa.

Filed May 1, 1986, Ser. No. 858,159

Int. Cl.[4] A01F *12/00*

U.S. Cl. 130—27 J **11 Claims**



1. In an axial flow combine harvester having a mobile frame adapted for movement over the ground and a threshing and separating rotor rotatably supported by said frame and including rasp bar assemblies cooperable with circumferentially mounted concaves to remove grain from crop material fed between said concave and said rotor, said concave having a plurality of rub bars mounted between spaced-apart arcuate frame members supported by said mobile frame adjacent said rotor, the improvement comprising:

a concave extension having a number of rub bars mounted in a subframe assembly and detachably connectable to said concave frame member, said concave extension having a first end provided with engagement means cooperable with each of at least two mounting members carried by each of said concave frame members and radially spaced with respect to said rotor to permit a rotative movement of said subframe assembly relative to said concave frame members and a second end provided with a hole therethrough and alignable with a number of spaced apart openings in said concave frame members upon rotation of said subframe assembly about said engagement means, both said first end and said second end of said concave extension being selectively positionable relative to said concave by the selective mounting of said engagement means on a selected one of said mounting members and by a fastener interengaging said hole and one of said aligned openings such that the concave extension rub bars are positionable as a unit in variable configurations with respect to the concave rub bars.

4,711,076

CUTTING BLADE AND METHOD OF USE

Frederick N. Long, 2915 Hillview St., Sarasota, Fla. 33579

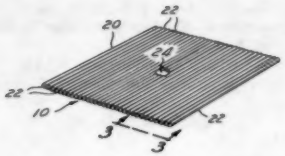
Filed Mar. 5, 1986, Ser. No. 836,250

Int. Cl.[4] A01D *34/73*

U.S. Cl. 56—295 **19 Claims**

1. An improved cutting blade device for use on rotary vegetation cutting equipment comprising;

a substantially planar member formed of a multiplicity of elongate tubular segments interconnected in a side by side orientation; and



means formed on said planar member for mounting said planar member to rotary vegetation cutting equipment for rotational movement therewith.

4,711,077

CUTTER HOUSING FOR POWER-DRIVEN LAWN MOWER

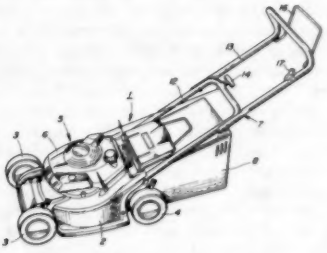
Mitsuhiro Kutsukake; Takahiko Murata; Gunji Saito; Takeshi Komatsuzaki; Kuniaki Uehara; Toshinobu Kato; Takeo Hattori, all of Saitama, and Morimasa Hayashida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,720

Claims priority, application Japan, Nov. 30, 1984, 59-253175; Nov. 30, 1984, 59-253177; Nov. 30, 1984, 59-181816[U]; Dec. 1, 1984, 59-254499; May 16, 1985, 60-72757[U]; May 17, 1985, 60-105318; May 17, 1985, 60-73153[U]; May 17, 1985, 60-73160[U]

Int. Cl.[4] A01D *67/00*

U.S. Cl. 56—320.2 **13 Claims**



1. A cutter housing for use in a power-driven lawn mower having an engine for driving a cutter blade, comprising:

a substantially cylindrical skirt wall which opens rearwardly;

a top wall substantially closing the upper end of said skirt wall;

said top wall having a substantially central recess for accommodating the engine therein and including a pair of half members positioned one on each side of said recess and lying substantially flush with each other in symmetrical and contiguous relation;

a rear housing portion extending rearwardly from said skirt and top walls in contiguous relation;

a partition disposed in said rear housing portion and dividing the same into two spaces; and

said skirt wall, said top wall, said rear housing portion, and said partition being integrally molded of synthetic resin.

4,711,078

BALER AND PROCESS FOR MAKING BALES OR FOR OPERATING THE BALER

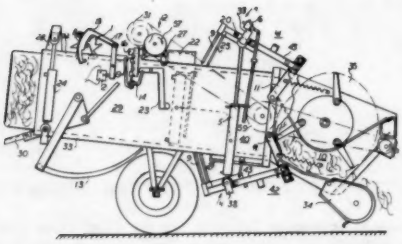
Siegfried Schaible, Singen/Htwl; Heinz Hohlwegler, Gottmadingen, and Bernhard Kohl, Winkelhaid, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Gottmadingen, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,876

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1984, 3436883

Int. Cl.[4] A01D *39/00*

U.S. Cl. 56—341 16 Claims



1. In a process for making rectangular bales from crop material from grass, cultivated plants and the like in a baler wherein said crop material is fed into a chamber for pressing and binding by a feed mechanism from an intake mechanism, said bales being bound by cord in said chamber, the improvement wherein said crop material from grass, cultivated plants, and the like is fed continuously in a strand into said baler, and in a predetermined time interval a bale separator is operated to cut away one of said bales from said strand, thereafter said bale separator acting to retain said crop material and simultaneously sliding forward in the feed direction of said bale, said bale separator by continuous additional supply of said crop material also being pushed forward in said feed direction until a binding position for said cut away one of said bales has been reached forming a gap between said cut away one of said bales and said continuous additional supply of said crop material, and after reaching said binding position the process of binding said cut away one of said bales with cord is activated by a binding control mechanism, and after said process of binding is complete said cut away one of said bales which has been bound is pushed out of said binding position by the next one of said bales formed by said bale separator of the bales being separated from the strand of said crop material fed into said baler by plunging into said crop material two separator units from above and below each comprising a plurality of pronglike first separating elements and pronglike second separating elements attached to each of said separator units, wherein said separator units are structured so that a part of said separator units can be slid forward in said feed direction with respect to said crop material and another fixed part of said separator units, whereby cord is put around three sides of said cut away one of said bales, said cord being at the entrance of said binding chamber extending between a plurality of rotatable tiers positioned above said binding chamber and cord guide arms positioned below said binding chamber, and pushing said bale, when completely formed, out of said baler by said next one of said bales being formed.

4,711,079

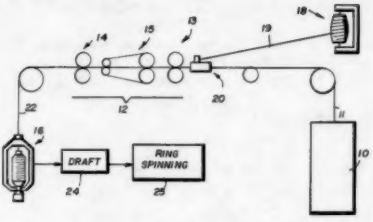
ROVING BLENDING FOR MAKING SHEATH/CORE SPUN YARN

Feaster H. Newton, Asheboro, and Kenneth Y. Wang, Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 31, 1986, Ser. No. 824,788

Int. Cl.[4] D02G *3/04, 3/38;* D01H *5/00*

U.S. Cl. 57—12 19 Claims



1. A method of producing a yarn having a sheath and core configuration, utilizing a drafting apparatus comprising front and back rollers, with an apron therebetween, comprising the steps of:

(a) feeding a sliver of first fibers, and a roving of second fibers, the second fibers having distinctly different properties than the first fibers, to the drafting apparatus so that the roving of second fibers is at the center line of, and on top of, the sliver of first fibers;

(b) passing the roving and sliver together through the rear rolls, apron, and front rolls of the drafting apparatus to produce a drafted composite sliver; and

(c) mechanically imparting a twist to the drafted composite sliver to produce a roving having a core and a sheath covering the core, the roving of second fibers being a roving having a twist multiple of about 0.25–0.8 turns per inch.

4,711,080

SPUN YARN AND METHOD AND APPARATUS FOR FORMING SPUN YARN

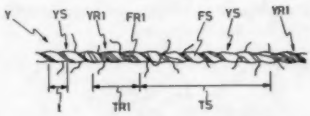
Toshimi Shibazaki, Takarazuka, and Teruo Nakayama, Ohtsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 5, 1986, Ser. No. 826,284

Claims priority, application Japan, Feb. 8, 1985, 60-23960

Int. Cl.[4] D02G *3/00, 3/38, 1/16*

U.S. Cl. 57—207 22 Claims



1. A bound spun yarn comprising substantially twistless core fibers and wound fibers wound spirally around the core fibers, said core fibers and said wound fibers differing from one another with respect to at least one physical characteristic, the number of said wound fibers varying randomly in the longitudinal direction of the yarn.

4,711,081

THREAD BRAKE MECHANISM FOR A SPINDLE ASSEMBLY OF A THREAD PROCESSING MACHINE

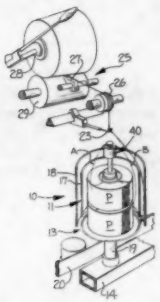
Johannes Frentzel-Beyme, Monchen-Gladbach, and Heinz Stenmans, Grefrath, both of Fed. Rep. of Germany, assignors to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Feb. 6, 1987, Ser. No. 11,923

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605193

Int. Cl.[4] D01H *7/86, 13/10, 15/00;* **B65H** *59/26*

U.S. Cl. 57—279 **16 Claims**



1. A thread brake mechanism adapted to be attached to a spindle assembly of a thread processing machine, particularly a thread entry tube of a two-for-one twister, and characterized by a construction for use with two independent individual threads which may be fed into the spindle assembly at varying tensions and which applies respective braking forces to the individual threads depending upon the respective feeding tension thereof; said thread brake mechanism comprising:

a tubular brake housing including means for attaching said brake mechanism to the spindle assembly of a thread processing machine and defining on the upper end thereof a thread entry aperture aligned with the longitudinal central axis thereof;

a brake ring member positioned inside said brake housing and being aligned with the longitudinal central axis of said brake housing and axially spaced from said thread entry aperture and defining an inside inclined braking surface extending downwardly and inwardly in an axially-symmetrical manner over the entire braking surface; and

a disc-shaped brake body member movably positioned inside said brake housing and supported by said brake ring member on said braking surface thereof for axial and radial movement and having a convexly curved outside edge braking surface for cooperating with said braking surface of said brake ring member for receiving the two threads therebetween and applying respective braking forces thereto.

3. In a tow-for-one twister textile yarn processing machine having a plurality of spindle assemblies, each including a thread entry tube and an elongate thread passageway extending from said thread entry tube through said spindle assembly and including a selectively-operated pneumatic threading mechanism having a compressed air-operated injector nozzle for sucking thread into said thread entry tube and blowing thread out through said passageway for automatically threading the thread through said spindle assembly during a thread-up operation; the combination therewith of a thread brake mechanism attached to said yarn entry tube and characterized by a construction for use with two independent individual threads which may be fed into said spindle assembly at varying tensions and which applies respective braking forces to the individual threads depending upon the respective feeding tension thereof, said thread brake mechanism comprising

a tubular brake housing including means for attaching said brake mechanism to said thread entry tube of said spindle assembly and defining on the upper end thereof a thread entry aperture aligned with the longitudinal central aixs thereof,

a brake ring member positioned inside said brake housing and being aligned with the longitudinal central axis of said brake housing and axially spaced from said thread entry aperture and defining an inside inclined braking surface entending downwardly and inwardly in an axially-symmetrical manner over the entire braking surface,

a disc-shaped brake body member movably positioned inside said brake housing and supported by said brake ring member on said braking surface thereof for axial and radial movement and having a convexly curved outside edge braking surface for cooperating with said braking surface of said brake ring member for receiving the two threads therebetween and applying respective braking forces thereto, and

pneumatically-operated piston means having a central thread passageway therethrough and carrying said brake ring member and being movably positioned in said tubular brake housing in alignment with the longitudinal central axis thereof for movement, upon actuation of said compressed air-operated injector nozzle of said threading mechanism, from an upper braking position of said brake ring member to a lower threading position in which said braking surface of said brake ring member is out of engagement with said braking surface of said brake body member, said piston means including spring means normally biasing said piston means and said ring brake member into the upper braking position.

4,711,082

METHOD AND APPARATUS FOR STARTING UP A FRICTION SPINNING ASSEMBLY

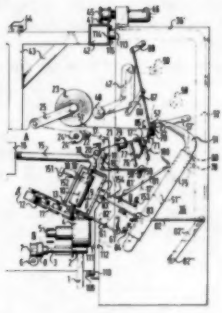
Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,181

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536911

Int. Cl.[4] D01H *15/02*

U.S. Cl. 57—263 **8 Claims**



1. In a friction spinning assembly including: friction surfaces movable in opposite directions forming a spinning wedge, at least one of the friction surfaces being a perforated drum having a suction device with a suction nozzle acting on the spinning wedge by suctioning air through the wall of the at least one perforated drum; at least one suction device acting on the spinning wedge; and an automatic startup device performing a thread joining operation; a method for starting up the friction spinning assembly, which comprises: inserting a thread for thread joining into the spinning wedge; suctioning air through the at least one perforated drum; and simultaneously feeding

fibers to the spinning wedge with a fiber feeding device, moving the friction surfaces and drawing-off thread from the spinning wedge with a thread drawing-off device, at a given normal spinning operation speed.

4,711,083

FRICTION SPINNING APPARATUS

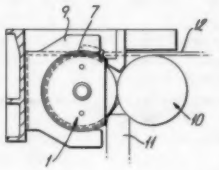
Douglas O. Clough, Rossendale, England, assignor to Hollingsworth UK, Ltd., Accrington, England

Filed Jul. 7, 1986, Ser. No. 882,322

Claims priority, application United Kingdom, Nov. 22, 1985, 8528845

Int. Cl.[4] D01H *7/885*

U.S. Cl. 57—301 **8 Claims**



1. Friction spinning apparatus including:

(a) a pair of parallel adjacently arranged first and second friction spinning rollers;

(b) means driving said first and second friction spinning rollers in the same sense and defining a spinning nip;

(c) means for feeding fibres to said spinning nip;

(d) an air discharge nozzle directed to discharge air at the periphery of said first friction spinning roller with a first component of movement along, and close to, the surface of at least said first friction spinning roller, and a second component of movement circumferentially around the said first friction spinning roller, for urging unwanted fibres along the nip towards one end thereof;

(e) a cylindrical shroud closely surrounding said first friction spinning roller; and

(f) means defining an annular clearance defined between said shroud and said first friction spinning roller; said air-discharging nozzle being arranged to discharge a jet of air into said annular clearance with said second component of movement opposed to the direction of movement of said first friction spinning roller in use of the spinning apparatus.

4,711,084

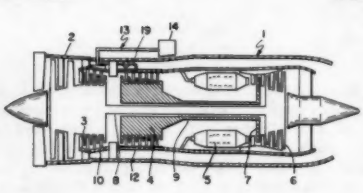
EJECTOR ASSISTED COMPRESSOR BLEED

Walter D. Brockett, North Haven, Conn., assignor to Avco Corporation, Providence, R.I.

Filed Nov. 5, 1981, Ser. No. 318,302

Int. Cl.[4] F02C *6/18, 3/00*

U.S. Cl. 60—39.07 **1 Claim**



1. Apparatus for bleeding air from a low pressure stage of a multi-stage compressor in a gas turbine engine comprising:

a shroud surrounding the low pressure compressor stage, said shroud being constructed with at least one bleed aperture;

a manifold mounted on the shroud and enclosing a reservoir communicating with the bleed aperture, said manifold having at least one outlet passage communicating with said reservoir;

an ejector nozzle mounted in the outlet passage of the manifold in a direction away from the manifold, said nozzle being connected to a source of bleed air from a high pressure compressor stage of the gas turbine engine, said nozzle being constructed and positioned within the outlet passage to draw air from the reservoir when high pressure bleed air flows from the nozzle; and

means controlling the flow of high pressure bleed air through the nozzle.

4,711,085

GAS TURBINE ENGINE FUEL SYSTEMS

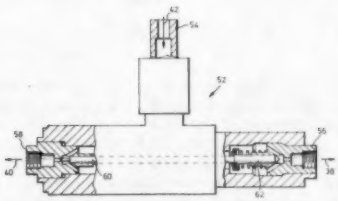
Michael R. Lyons, Leicester, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 18, 1986, Ser. No. 830,138

Claims priority, application United Kingdom, Apr. 25, 1985, 8510568

Int. Cl.[4] F02C *7/26*

U.S. Cl. 60—39.141 **3 Claims**



1. A fuel system for a gas turbine engine comprising:

at least one primary fuel injector;

at least one secondary fuel injector;

a primary fuel supply line operatively connected to said at least one primary fuel injector;

a secondary fuel supply line operatively connected to said secondary fuel injector;

means for supplying fuel to said primary fuel supply line and to said secondary fuel supply line;

fuel flow restricting means in each of said primary and said secondary fuel supply lines; and

valve means operatively connected to said fuel supply means and to said primary and secondary fuel supply lines downstream of said fuel flow restricting means in each, said valve means comprising a solenoid valve arranged in parallel with said flow restricting means in each of said primary and secondary fuel supply lines where said valve means is selectively operable to direct fuel to bypass said fuel flow restricting means in one of said primary and secondary fuel lines.

4,711,086

TRIDENT II FIRST AND SECOND STAGE INTERNAL INSULATION

Darrell L. Offe, Guernsey, Wyo., and R. Gregory Martin, South Jordan, Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1986, Ser. No. 921,571

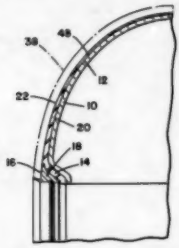
Int. Cl.[4] F02K *9/00;* **B29C** *71/00*

U.S. Cl. 60—253 **1 Claim**

1. A rocket motor insulator assembly comprised of a forward and an aft insulator assembly joined by a vulcanized bond to form a cylinder having forward and aft contoured domes and a stress relief flap wherein:

said forward insulator assembly comprises a forward insulator of varied thickness having an outside contour and an inside surface, said forward insulator being formed by laying rubber stock on a first mandrel followed by curing and grinding said outside contour to the desired configuration, a forward bearing ring and a first and a second forward insulator element bonded to said forward bearing ring and concurrently joined by vulcanization to said forward insulator;

said aft insulator assembly comprises an aft insulator of varied thickness having an outside contour, said aft insulator being formed by laying rubber stock on a second mandrel, followed by curing and grinding said outside contour to the desired configuration, an aft bearing ring



and a first and a second aft insulator element bonded to said aft bearing ring and concurrently joined by vulcanization to said aft insulator;

said vulcanized bond is formed by removing said forward and said aft insulator assemblies from said first and said second mandrels, placing said assemblies on a collapsible mandrel in such a manner so that said forward and said aft insulators are adjacent and form a junction having a gap and placing a filler of uncured rubber in said gap and a strip of uncured rubber at said junction to splice said forward and said aft insulators; and

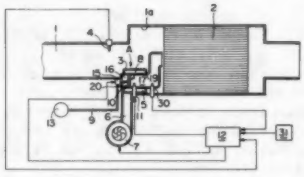
said stress relief flap comprises a free-moving flap element and a rubber bulb having a stress relief groove formed by a silicone extrusion, said bulb lying adjacent to and bonded to said inside surface of said forward insulator.

4,711,087

EMISSIONS FILTER REGENERATION SYSTEM

Hideo Kawamura, Kanagawa, Japan, assignor to Isuzu Motors, Ltd., Japan

Filed Jun. 23, 1986, Ser. No. 877,493
Claims priority, application Japan, Jun. 26, 1985, 60-137838
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—286 **7 Claims**



1. An emissions filter regeneration system comprising:

a particulate matter filter having an inlet connected by an exhaust pipe to an exhaust manifold of an engine;

a pressure sensor disposed to sense the pressure at said inlet of said filter;

a cylindrical combustion chamber having an outlet opening disposed to discharge gases into said inlet;

a cylindrical vaporization chamber axially aligned with and separated from said combustion chamber by an apertured fuel distribution plate;

fuel supply means for introducing fuel into said vaporization chamber;

air supply means for introducing air into said combustion chamber, said air supply means comprising a cylindrical member defining an annular air chamber surrounding said combustion chamber and communicating therewith through openings therein;

ignition means for igniting a fuel and air mixture in said combustion chamber;

an electric heater disposed in said plate to vaporize fuel transmitted from said vaporization chamber to said combustion chamber;

a revolution sensor for sensing the revolution rate of the engine; and

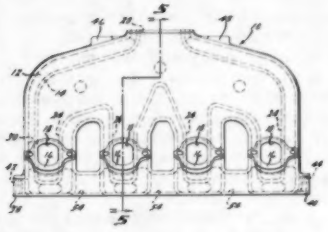
control means for activating said fuel supply means, said air supply means, and said ignition means in response to sensing by said pressure sensor of a pressure at said inlet above a selected predetermined value determined by the revolution rate sensed by said revolution sensor.

4,711,088

LIQUID COOLED EXHAUST MANIFOLD

Donald J. Berchem, West Bend, and James R. Meininger, Plymouth, both of Wis., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 8, 1987, Ser. No. 1,500
Int. Cl.[4] F01N *3/02, 7/10*
U.S. Cl. 60—321 **3 Claims**



1. For an internal combustion engine, a liquid cooled exhaust manifold of the type having individual exhaust gas inlets positioned in a low portion of the manifold and fluidly connected to passages extending upwards to an exhaust gas outlet at a higher portion of the manifold, comprising:

a manifold housing having spaced inner and outer wall means, the inner wall means defining individual exhaust gas inlets and passages extending generally upward;

the wall means further defining a common exhaust gas collector portion fluidly connected to the individual gas passages and further defining an outlet aperture located higher in the exhaust manifold than the inlet apertures;

the spaced inner and outer wall means defining a coolant flow passage therebetween including individual coolant passages about each individual exhaust gas passage;

inlet means for liquid coolant located low in the manifold to introduce coolant to the individual coolant flow passages;

outlet means for liquid coolant located higher in the exhaust manifold than the inlet means to discharge coolant from the manifold;

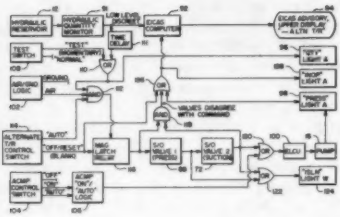
a transversely extending passage forming means extending normally to the upward flow passages low on the manifold and fluidly connected to the individual coolant flow passages whereby the transverse passage means distributes coolant evenly to each individual coolant flow passage.

4,711,089

HYDRAULIC SYSTEM FOR AIRCRAFT

Ralph Archung, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 16, 1984, Ser. No. 631,225
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—405 18 Claims



1. A hydraulic system for an aircraft, said system comprising:

a. a fluid reservoir comprising a containing structure defining a fluid containing chamber and having a top wall and a bottom wall, said reservoir further comprising a first fluid inlet means having a first fluid inlet opening located at a position spaced above said bottom wall and below said top wall, said chamber having an upper chamber portion located above said first inlet opening, and a lower chamber portion located below said first inlet opening, a second fluid inlet means having a seoond fluid inlet opening located below said first inlet opening at an inlet location at a lower part of said lower chamber portion;

b. a first hydraulic power outlet means;

c. a second hydraulic power outlet means;

d. a pump means to draw fluid from the reservoir and to deliver fluid to the first and second power outlet means, said pump means having an operative flow connection with said reservoir which is characterized in that with a low level fluid condition in said reservoir and with said pump not operating, fluid would flow from said pump means to said reservoir;

e. a first supply isolation valve having a first position and a second position, and being operatively connected to the first and second inlet means and to the pump means, said supply isolation valve in its first position delivering fluid from said first inlet means to the pump means, said supply isolation valve in its second position delivering fluid from the second inlet means to the pump means;

f. a second pressure isolation valve operatively connected to the pump means and having a first position and a second position, said pressure isolation valve in its first position permitting flow from the pump means to the first power outlet means, and in its second position blocking flow from the pump means to the first power outlet means, while permitting flow from the pump means to the second power outlet means;

g. fluid level monitoring means to detect when fluid level in said chamber is at or below a predetermined caution level and to produce a corresponding low level signal;

h. control means to become operative in response to said low level signal to move said first and second valves to their second positions, and to cause said pump means to operate;

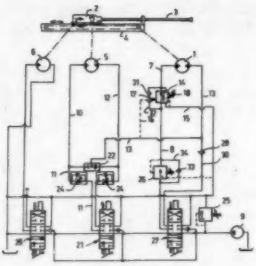
whereby in the event of fluid loss in the system, said pressure isolation valve in its second position is able to alleviate loss of fluid for said pump means, and said supply isolation valve in its second position is able to direct fluid from said lower chamber portion to said pump means, with operation of said pump means preventing loss of fluid from said pump means.

4,711,090

METHOD OF AND DEVICE FOR ADJUSTING THE FEED MOVEMENT OF A DRILL ROD FOR DRILLING A ROCK

Eero Hartiala, Kangasala; Jaakko Kuusento, Tampere, and Hannu Paasonen, Nokia, all of Finland, assignors to Oy Tampella Ab, Tampere, Finland

Continuation of Ser. No. 617,624, Jun. 6, 1984, abandoned. This application Apr. 22, 1987, Ser. No. 41,644
Claims priority, application Finland, Jun. 14, 1983, 832145
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—422 9 Claims



1. A device for adjusting feed movement of a drill rod for drilling rock, comprising:

a pressure-medium-operating rotary motor (5) for rotating a drill rod, the rotary motor having a pressure side (10) for a pressure medium, the pressure of the pressure medium at the pressure side (10) changing in response to a change in rotation resistance on the rotary motor;

a pressure-medium-operated feed motor (1) for feeding the drill rod in a drilling direction and a opposite direction of feed movement, the feed motor having a pressure side (7) and an outlet side (13) for the pressure medium for the feed motor (1) to respond to a higher pressure of the pressure medium at the pressure side (7) thereof relative to a lower pressure of the pressure medium at the outlet side (13) thereof with feed movement of the drill rod in the drilling direction and, vice versa, the opposite direction; and

pressure-medium connection means for supplying the pressure medium to the pressure sides (10,7) of the rotary and feed motors (5,1), connecting the pressure side (10) of the rotary motor (5) to the outlet side (13) of the feed motor (1), and (14,16; 14,20) acting the pressure change of the pressure medium of the pressure side (10) of the rotary motor (5) oppositely on the pressure medium of the pressure and outlet sides (7,13) of the feed motor (1) in inverse and direct dependence on the pressure change, respectively.

4,711,091

APPARATUS FOR PREVENTING THE RISE OF OIL IN A STIRLING ENGINE

Kazuhiko Kawajiri; Michio Fujiwara; Kazunori Tsuchino, and Youichi Hisamori, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 18, 1987, Ser. No. 15,979
Claims priority, application Japan, Feb. 21, 1986, 61-37748; Feb. 21, 1986, 61-37749
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—517 4 Claims

1. An apparatus for preventing lubricating oil from rising to the working spaces of a Stirling engine, the Stirling engine having a rod which reciprocates inside a cylindrical member, comprising:

a first oil-absorbing member which has an annular shape and which is secured to said rod so as to reciprocate therewith, the outer periphery of said first oil-absorbing member

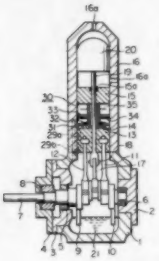
being in sliding contact with the inner surface of said cylindrical member;

an oil scattering-preventing plate which has an annular shape and which is mounted on said rod above said first oil-absorbing member in intimate contact with said first oil-absorbing member, the outer diameter of said scattering-preventing plate being smaller than the inner diameter of said cylindrical member;

a second oil-absorbing member which has an annular shape, which is permeable to air, and which is secured along its outer periphery to the inner surface of said cylindrical member above and separated from said oil scattering-preventing plate, the inner periphery of said second oil-absorbing member being in sliding contact with the outer surface of said rod;

means for making the flow speed of gas which through said second oil-absorbing member during the operation of said Stirling engine higher from above to below said second oil-absorbing member than from below to above said second oil-absorbing member; and

an annular baffle which is secured to said rod above and separated from said second oil-absorbing member, the outer diameter of said annular baffle being smaller than the inner diameter of said cylindrical member.

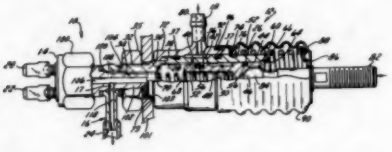


4,711,092

LIGHT SWITCH AND BRAKE LINE CONNECTOR ASSEMBLY

Allan E. Prusak, Washington, Wis., assignor to Hayes Industrial Brake, Inc., Mequon, Wis.

Filed Aug. 6, 1986, Ser. No. 893,623
Int. Cl.[4] B60T 17/22
U.S. Cl. 60—534 **8 Claims**



1. The combination with a master cylinder having a threaded passage connected to the high pressure chamber on the master cylinder and a pressure actuated brake light switch and brake line connector assembly, said assembly comprising

a housing having a tubular stem forming a passage to said housing, said stem having a threaded section at the end for mounting on the threaded passage of the master cylinder,

an annular groove around said stem,

a port in said stem connecting said groove to said passage in said stem,

a shoulder at the inner end of the stem, and

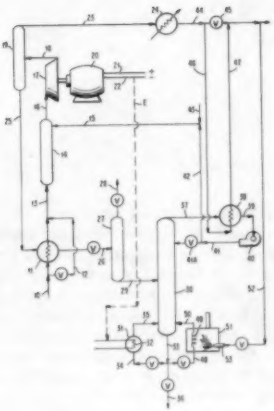
a Banjo type connector assembly mounted on the stem in abutting relation to such shoulder for connecting the groove to the brake line.

4,711,093

COGENERATION OF ELECTRICITY AND REFRIGERATION BY WORK-EXPANDING PIPELINE GAS

Stephen J. Markbreiter, Edison, N.J., and Daniel J. Dessanti, Brooklyn, N.Y., assignors to Kryos Energy Inc., New York and The Brooklyn Union Gas Company, Brooklyn, both of, N.Y.

Filed Feb. 27, 1987, Ser. No. 19,924
Int. Cl.[4] F25B 9/00
U.S. Cl. 62—87 **10 Claims**



1. The process for the cogeneration of electricity and commercially saleable refrigeration by expanding pressurized pipeline gas with the performance of work which comprises:

injecting methanol into said pipeline gas;

passing said pipeline gas containing said methanol through a turbo-expander coupled to an electrical generator to reduce the pressure of said pipeline gas at least 100 psi but not reducing said pressure enough to drop the temperature of the resulting cold expanded gas below about −100° F., said electrical generator simultaneously yielding said electricity;

separating aqueous methanol condensate from said cold expanded gas and introducing said condensate into a distillation column for separation into discard water and recycle methanol for injection into said pipeline gas;

recovering said saleable refrigeration from said cold expanded gas;

adding reboiler heat to said distillation column in an amount required to warm said expanded gas after the recovery of said saleable refrigeration therefrom to a predetermined temperature above 32° F.; and

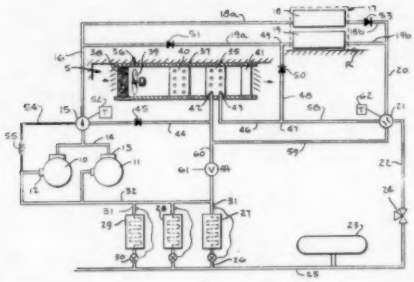
passing said expanded gas after the recovery of said saleable refrigeration therefrom in heat exchange with methanol vapor rising to the top of said distillation column to condense said methanol vapor so that liquid methanol is obtained partly for reflux in said distillation column and partly for said recycle methanol and simultaneously said expanded gas is warmed to said predetermined temperature above 32° F.

4,711,094

REVERSE CYCLE HEAT RECLAIM COIL AND SUBCOOLING METHOD

Roland A. Ares, St. Charles County; Robert A. Jones, Franklin County, and Norman E. Street, St. Charles County, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.

Filed Nov. 12, 1986, Ser. No. 929,422
Int. Cl.[4] F25D *17/08*
U.S. Cl. 62—90 **21 Claims**



18. In combination with a refrigeration system including compressor means having discharge and suction sides, condenser means, receiver means and multiple evaporator means, a heat reclaim coil disposed in an air handler unit adapted to seasonally condition air for heating and cooling space air in a building, said heat reclaim coil having first and second piping connections and being selectively connected in said refrigeration system for reverse cycle operation between a heating mode and a subcooling mode, a first reversing valve located on the discharge side of said compressor means and having a summer position connecting said discharge side to said condenser means and a winter position for connecting said discharge side to said first piping connection of said heat reclaim coil, a second reversing valve located upstream of said receiver means and having a summer position and a winter position, said second reversing valve connecting said condenser means to the second piping connection of said heat reclaim coil and the first piping connection of said heat reclaim coil to said receiver means in the summer position thereof, and said second reversing valve connecting said condenser means to said receiver means in the winter position thereof.

4,711,095

COMPARTMENTALIZED TRANSPORT REFRIGERATION SYSTEM

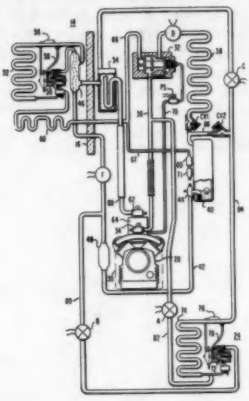
Leland L. Howland, Belle Plaine, and Jayaram Seshadri, Minneapolis, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Oct. 6, 1986, Ser. No. 915,827
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—117 **8 Claims**

1. In a compartmentalized transport refrigeration system, a method of controlling the temperature in a first compartment of a trailer to a first set point via a host refrigeration unit having a compressor, condenser, receiver, evaporator, and accumulator, and the temperature of a second trailer compartment to a second set point via a remote evaporator having liquid, hot gas and suction lines selectively connectable to the host refrigeration unit, the steps of:

preventing the host unit from going into a heating mode when the host unit requires heat to maintain the first set point, in response to predetermined conditions which include the remote unit requiring cooling to maintain the second set point while the host unit is controlling to a first set point which is below a predetermined value,

and directing all discharge gas from the compressor to the remote evaporator when the remote evaporator requires



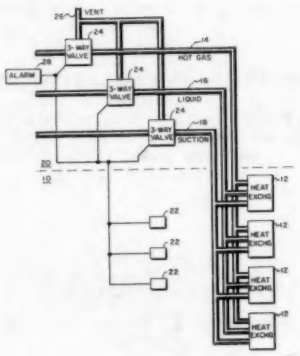
heat to maintain the second set point, while the host unit is not in a heating mode.

4,711,096

LEAK DETECTION AND REFRIGERANT PURGING SYSTEM

Herman F. Krantz, 728 Benton Ct., Elmhurst, Ill. 60126

Continuation of Ser. No. 840,158, Mar. 17, 1986, abandoned. This application Mar. 13, 1987, Ser. No. 23,898
Int. Cl.[4] F25B *45/00*; F16F *1/34*
U.S. Cl. 62—129 **3 Claims**



1. Apparatus responsive to refrigerant leaks occurring in that portion of a refrigerant system disposed within a refrigerated environment comprising

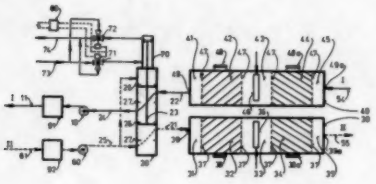
at least one sensor disposed within said refrigerated environment for detecting leakage of refrigerant into said environment and producing an output signal in response thereto; and

valve means disposed in the path of refrigerant flow, coupled to said sensor, and operative in response to said output signal to interrupt the flow of refrigerant to that portion of said refrigeration system within said environment and for venting only that refrigerant as may be in said portion of said system to the outside of said environment.

4,711,097
APPARATUS FOR SORPTION DEHUMIDIFICATION AND COOLING OF MOIST AIR

Ferdinand Besik, 2562 Oshkin Crt., Mississauga, Ontario, Canada L5N 3Z3

Filed Oct. 24, 1986, Ser. No. 922,887
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—271 8 Claims



1. An apparatus for dehumidifying and cooling moist air comprising:

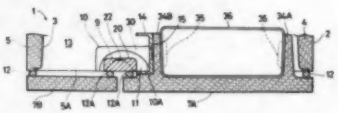
two identical fixed bed treatment units providing dehumidification and cooling of said moist air, said treatment units each being a closed vessel provided with an air intake and an air exit openings located on its opposite end walls, said vessel having its inside space separated by four parallel build in screens into five consecutive chambers permitting a straight line flow of said moist air through said five consecutive chambers, said first and fifth chambers being empty chambers, said second chamber being equipped with two flanged openings located on one of its side walls and being provided for filling in and for removing from said chamber a solid heat exchanging material, said second chamber being filled with said heat exchanging material to provide a fixed bed of said heat-exchanging material of a specific fixed bed porosity, said fixed bed of heat exchanging material being provided for transfering heat from said dehumidified moist air stream into a second air stream, said second air stream being used as regenerant air stream, said third chamber being equipped with a build in air heater providing heating of said second air stream, said fourth chamber being equipped with two flanged openings located on one of its side walls and provided for filling in and removing from said fourth chamber a solid sorbent material, said fourth chamber being filled with said solid sorbent material to provide a fixed bed of said sorbent material of specific porosity, said fixed bed of said sorbent material providing the removal of moisture from said moist air, said two fixed bed treatment units being provided with valving means, said valving means providing switching of said moist air stream and said second air stream between said two fixed bed treatment units in the middle of the operating cycle in a manner permitting continuous countercurrent cyclic operation of said two treatment units, said cyclic operation having an operating cycle comprising a sorption period followed by a desorption period, said operating cycle having its duration controled by a solid state on-off cyclic timer actuating said valving means, said sorption period being provided for removing moisture from said moist air stream in said fixed bed of said sorbent material and for cooling of said dehumidified moist air stream in said fixed bed of said heat exchanging material, said desorption period being provided for preheating of said second air stream in said fixed bed of said heat exchanging material and for heating of said second air stream by said air heater, and for desorption of said moisture from said fixed bed of sorbent material accumulated by said sorbent material during said sorption period and for discharging of said desorbed moisture out of said apparatus,

two air blowers for pumping said moist air and said second air streams through said treatment units, said moist air and second air streams flowing continuously through said two treatment units countercurrently to each other with said moist air stream flowing through said one treatment unit while said second air stream flowing through said other treatment unit during the first half of the operating cycle, with the flow of said moist air and second air streams being switched between said two treatment units in the middle of said operating cycle by said valving means in a manner permitting a cyclic countercurrent sorption-desorption and heat transfer to occur in said fixed bed treatment units.

4,711,098
REFRIGERATOR

Takashi Kuwabara, Ohizumi; Yoshiharu Shimura, Ota; Yuko Hayashi, Ohizumi; Toshiyuki Hanamure, Ohizumi; Kaoru Kanemori, Ohizumi, and Yoshihiro Yamakawa, Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Oct. 10, 1986, Ser. No. 917,398
Claims priority, application Japan, Oct. 11, 1985, 60-155838[U]; Nov. 6, 1985, 60-171075[U]
Int. Cl.[4] F25D *11/02*
U.S. Cl. 62—441 5 Claims



1. A refrigerator comprising:

an insulated box having an opening and a cooling mechanism;

first and second doors of French door type pivotally mounted on said opening and having gaskets at the rear fringe thereof which come in contact with the edge of said opening to close said opening;

guide grooves formed at guide members protruding from the edges of the opening of the insulated box on the non-supporting side of said doors, consisting of a projecting part having a flat front with a surface formed to become nearly the same as that of the opening of the insulated box and a back composed of a semi-circular curve and a jetty formed behind said projecting part at a distance and having a curved surface facing the curved surface of said projecting part and having a curvature of a predetermined configuration;

a partition pivotally supported at the rear on the nonsupporting side of said first door, extending in the direction of the rotating axis of said first door with length nearly reaching the edges of said opening and having at both ends thereof engaging parts rotating along said guide grooves with the closing movement of said first door, and forming the contact surface of said gaskets with the surface of its front nearly joining the edges of said opening when the partition is rotated, and

a housing part provided at the rear of said first door and housing and holding said partition with said engaging parts protruded when said first door is open.

4,711,099
PORTABLE QUICK CHILLING DEVICE

George S. Polan, North Wales, Pa., and Hermann R. Glinecke, Morrisville, N.J., assignors to Central Sprinkler Corporation, Lansdale, Pa.

Continuation-in-part of Ser. No. 893,505, Aug. 5, 1986, abandoned. This application Aug. 29, 1986, Ser. No. 902,242
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 23 Claims

1. A portable chiller device comprising:

compressing means for compressing a refrigerant;

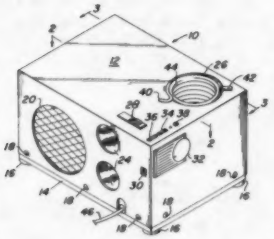
condensor means for condensing said refrigerant, said con-

densor means being operatively connected to said compressing means such that compressed refrigerant is received from said compressing means by said condensing means;

accumulating means for accumulating said refrigerant, said accumulating means being operatively connected to said condensor means such that condensed refrigerant is received from said condensor means by said accumulating means;

expanding means for expanding said refrigerant, said expanding means being operatively connected to said accumulating means such that condensed refrigerant in said accumulator means can escape through said expanding means, said expanding means being a capillary tube having a free end; and

evaporating means for evaporating said refrigerant, said



evaporating means being operatively connected to said expanding means such that escaping condensed refrigerant will evaporate in said evaporating means, said evaporating means being operatively connected to said compressing means such that evaporated refrigerant can pass from said evaporating means to said compressor means, said evaporating means including a coil of tubing shaped to receive a generally cylindrical object which is to be chilled each ring of said coil being in direct contact with an adjacent ring, an inwardly facing surface of each ring being flattened so as to contact the object over a flattened surface, said coil being angularly rotatable such that when said coil is rotated in a first direction, said coil expands in a radial direction, and when said coil is rotated in a second direction, said coil contracts, said expansion and contraction thereby allowing said cylindrical object to be placed in, removed from or locked into said coil.

4,711,100

CIRCULAR WEFT KNITTING MACHINE

E. C. Tibbals, Jr., Rt. 2, Box 386, High Point, N.C. 27260

Continuation of Ser. No. 761,764, Nov. 26, 1985, abandoned, which is a division of Ser. No. 398,303, Jul. 14, 1982, Pat. No. 4,608,839. This application Feb. 4, 1987, Ser. No. 14,205

Int. Cl.[4] D04B *15/24, 15/32*

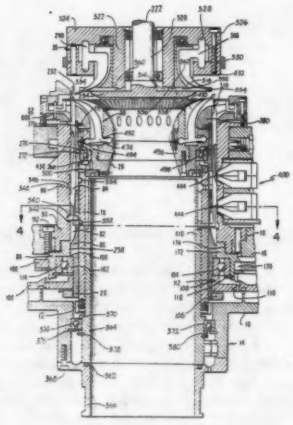
U.S. Cl. 66—55 **4 Claims**

1. In the circular weft knitting of articles, the steps of

downwardly displacing the hooked end of a reciprocable needle element from a fixed upper limit to a fixed lower limit to engage and draw down a loop of yarn while said needle is being displaced away from a yarn feed location concurrent with horizontal rotational displacement of a needle supporting rotatable knitting cylinder in either direction perpendicular to the path of said downward needle displacement,

concurrently radially inwardly and upwardly displacing a yarn engaging sinker element having at least first and second discrete yarn engaging land surfaces thereon in a first predetermined path relative to said knitting cylinder in conjoint timed relation with said downwardly moving hooked end of said needle element to engage the yarn on said first land surface and to maintain said yarn engagement therewith at least during a first predetermined degree of downward displacement of said hooked end of said reciprocable needle element from said upper limit toward said lower limit to cooperatively draw a loop of yarn of predetermined length and

the succeeding step of selectively displacing said yarn engaged sinker element in the radially outward and upward directions in a second predetermined path relative to said



knitting cylinder during a second predetermined and continued degree of downward displacement of said hooked end of said reciprocable needle element in approach of the lower limit of displacement thereof to shift the point of yarn engagement on said sinker element from said first land surface to said second land surface while maintaining said predetermined length of drawn loop of yarn substantially constant.

4,711,101

FLAT-BED KNITTING MACHINE

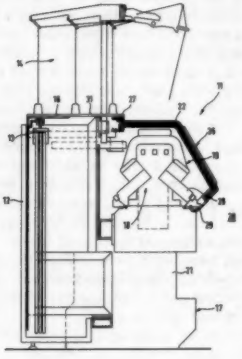
Ernst Goller; Adam Müller, and Udo Hermann, all of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 890,265

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528694

Int. Cl.[4] D04B *7/04*

U.S. Cl. 66—64 **24 Claims**



1. A flat-bed knitting machine, comprising:

a needle bed apparatus and associated carriage apparatus movable longitudinally on the machine;

cams and selector units; and

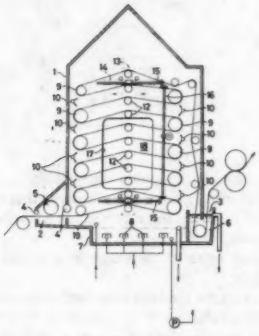
a data processing unit for controlling the cams and selector units and for storing pattern information in memory, said data processing unit having an input keyboard dsposed at the level of and in the area in front of the needle bed apparatus and associated carriage apparatus, said keyboard being movable in the longitudinal direction of the machine to any position along the machine and independently of the needle bed apparatus and associated carriage apparatus.

4,711,102

WET HEAT TREATING APPARATUS OF A CLOTH FOR PERFORMING DYEING AND WASHING IN COMBINATION

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd.

Filed Apr. 8, 1986, Ser. No. 849,572
Int. Cl.[4] D06B 3/12
U.S. Cl. 68—5 E **2 Claims**



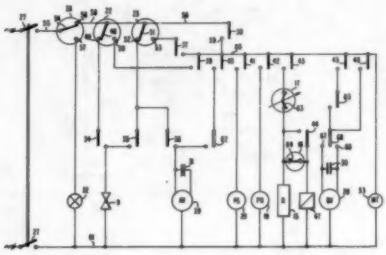
1. A wet heat treating appartus of a cloth for performing dyeing and washing where the apparatus can be changed over between dyeing and washing and where the apparatus can be cleaned in making the changeover, comprising an enclosed wet heat treating chamber having a pair of oppositely disposed and spaced apart substantially vertically extending side walls and a pair of oppositely disposed and spaced apart end walls extending transversely of said side walls, a ceiling forming an upper closure for said chamber and extending between said side walls, a cloth inlet in a lower part of one of said side walls and a cloth outlet in a lower part of the other of said side walls, a first group of substantially horizontal guide rolls located within said chamber and spaced apart in the vertical direction and located adjacent to the one said side wall and extending in the direction between said end walls, a second group of substantially horizontal guide rolls located within said chamber and spaced apart in the vertical direction and located adjacent the other said side wall and extending in the direction between said end walls, said second group of guide rolls located in paired horizontally spaced relation with said first group of guide rolls, a group of liquid supply means located within said chamber for supplying a high pressure hot liquid to the cloth guided to said chamber and passing over said first and second groups of guide rolls, a group of intermediate substantially horizontal guide rolls spaced apart in the vertical direction and spaced between and in paired relation with said first and second groups of guide rolls, means for supporting said group of intermediate guide rolls, a transfer mechanism for moving said supporting means and said group of intermediate guide rolls in generally the horizontal direction toward one or the other of said first and second groups of guide rolls, and a doorway in one of said end walls located in general alignment with said group of intermediate rolls whereby said group of intermediate rolls can be moved toward one of said first and second groups of guide rolls so that an operator can enter said chamber through said doorway for cleaning said groups of guide rolls without interference from said group of intermediate guide rolls.

4,711,103

CONTROLLING DEVICE FOR CLOTHES WASHING MACHINE

Maurizio Mori; Piero Babuin, both of Pordenone, and Giuseppe Cargnel, Treviso, all of Italy, assignors to Zanussi Elettrodomestici S.p.A., Pordenone, Italy

Filed May 13, 1986, Ser. No. 862,801
Claims priority, application Italy, May 24, 1985, 45715 A/85
Int. Cl.[4] D06F 33/02
U.S. Cl. 68—12 R **7 Claims**



1. In a controlling device for controlling the operation of a laundry washing machine of the type including a tub, a rotatable drum within said tub, a solenoid valve for controlling the introduction of washing liquid into said tub, a wash liquid collector communicating with a lower side of said tub through a flexible conduit and with an upper side of said tub through a pipe and a circulating pump for circulating washing liquid through said tub, a filtering element in said collector for filtering soil from the recirculated washing liquid, and an electric heating element in said collector for heating said recirculated washing liquid, said controlling device comprising thermostatic control means for controlling said heating element and level control means for controlling the level of said washing liquid, the improvement comprising:

said thermostatic control means comprising at least first and second thermostats calibrated at a fixed tripping temperature and at adjustable tripping temperatures, respectively;

said level control means comprising first and second pressure switches selectively connectable with said solenoid valve and calibrated to determine that the washing liquid is fed to a predetermined level in said tub and to a lower level in said collector and a third pressure switch connectable with both said first and second pressure switches and calibrated to detect the pressure of the washing liquid circulating upstream of said filtering element;

means for selectively connecting said first and second pressure switches to said heating element, in parallel with said circulating pump, through said first and second thermostats; and

control relay means responsive to said first and second thermostats for controlling operation of a program unit of the laundry machine.

4,711,104

WASHING MACHINE

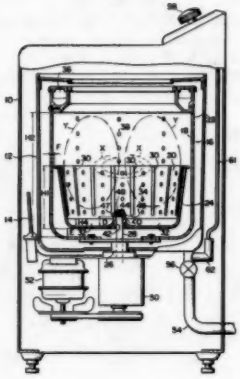
Yoshio Ikeda, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 618,349, Jun. 7, 1984, abandoned. This application Apr. 9, 1986, Ser. No. 850,078

Claims priority, application Japan, Jun. 9, 1983, 58-104504; Aug. 9, 1983, 58-145551; Aug. 22, 1983, 58-128421

Int. Cl.[4] D06F *23/04*

U.S. Cl. 68—23 R **18 Claims**



1. A washing machine comprising:

an outer casing open at a top end thereof;

a cylindrical washing tub coaxially disposed in said outer casing and rotatable about a fixed vertical axis, said washing tube formed with (1) a constant diameter upper peripheral wall section located at an upper region thereof, and (2) a stirring member, provided beneath said upper peripheral wall section and separately rotatable therefrom, with the only portion of said washing tub that is above a top-most end of said stirring member being said constant diameter upper section, said stirring member extending substantially halfway up the height of said washing tub, and having an inner peripheral surface formed such that its diameter gradually linearly increases from its lower portion toward its upper portion; and

means for rotating: (a) said stirring member and said tub together during a dehydration operation, and (b) said stirring member alternately in opposite directions during a washing operation while holding said tube stationary, said stirring member thereby rotating a bottom-most portion of said washing machine, while said upper peripheral wall remains stationary, which washes laundry due to the friction between the laundry and the rotating stirring member, and between the rotating laundry and the stationary upper peripheral wall, the varying diameter of said stirring member causing vertical motion of said laundry and increasing the washing effect.

4,711,105

WASHING MACHINE HAVING ROTARY BASKET IN WASHING TUB

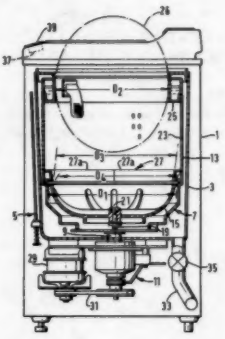
Susumu Oida, Komaki; Yoshikazu Munemoto, Tajimi; Masami Ueda, Ichinomiya, and Michiaki Ito, Seto, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 31, 1985, Ser. No. 793,339

Claims priority, application Japan, Dec. 18, 1984, 59-266892; Jan. 9, 1985, 60-1899; Jan. 11, 1985, 60-3802; Jan. 25, 1985, 60-9565[U]

Int. Cl.[4] D06F *23/04, 37/24*

U.S. Cl. 68—23.2 **13 Claims**



1. A clothes washing machine comprising:

a housing including a fixed tub disposed therein;

a washing tub disposed in said fixed tub for receiving clothes to be washed;

a bowl-shaped agitator disposed in a lower part of said washing tub;

a ring-shaped frame element attached to an inner surface of said washing tub, said frame element covering a gap between said inner surface of said washing tub and an outer surface of said bowl-shaped agitator to prevent clothes from being drawn into said gap; and

a motor, provided in said housing, for driving said bowl-shaped agitator during washing and rinsing.

4,711,106

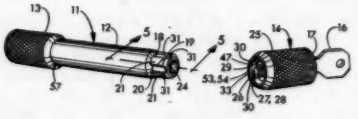
LOCKING DEVICE

Clyde T. Johnson, P.O. Drawer 100, Escanaba, Mich. 49829

Filed Dec. 31, 1986, Ser. No. 392

Int. Cl.[4] E05B *67/36*

U.S. Cl. 70—34 **14 Claims**



1. A locking device comprising:

(a) a stud including a first threaded surface and a keyed portion having at least one key; and

(b) a knob which locks over a forward portion of the stud, including

(i) a casing having an inner surface which defines a hole and at least one keyway extending axially through the casing such that when the knob is placed over a forward portion of the stud, each keyway receives the corresponding key on the stud to prevent rotation of the casing with respect to the stud;

(ii) a tumbler housing which is mounted in an axially fixed

position within a forward section of the casing hole, the tumbler housing including a plurality of locking key-operated slide tumblers which are substantially contained within the housing to permit rotation of the housing within the casing, and which are operatively extendable outside of the housing to engage a said keyway in the casing to prevent rotation of the housing within the casing; and

(iii) a second threaded surface connected to a rearward end of the tumbler housing such that when the knob is placed over a forward portion of the stud rotation of the tumbler housing in one direction causes the second threaded surface to engage the first threaded surface of the stud so that the forward portion of the stud is drawn into the rearward section of the casing hole.

4,711,107

LAMP

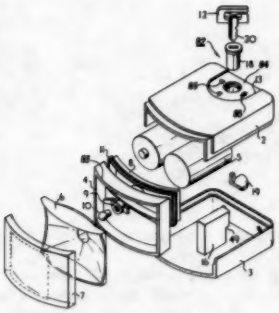
John H. Drane, London, England, assignor to Duracell Inc., Bethel, Conn.

Filed Feb. 4, 1986, Ser. No. 826,166

Claims priority, application United Kingdom, Feb. 7, 1985, 8503064

Int. Cl.⁴ E05B *73/00*; F21Y *29/00*

U.S. Cl. 70—233 **13 Claims**



1. In combination, an electrical accessory for a cycle, and a bracket for mounting the said accessory on a cycle, in which:

said accessory comprising a housing, an electrical switch in said housing for operating said accessory, a receptacle incorporated in and open to the exterior of the housing, a lock incorporated in said housing which lock is lockable and releasable by a removable key, said lock being operatively coupled to said switch, and a locking member in said housing adjacent said receptacle and operatively coupled to said lock for movement by said key relative to said receptacle;

said bracket comprises a body portion, clamping means such that said body portion can be clamped onto a cycle, and a projection extending from said body portion which projection has a configuration complementary to said receptacle and locking member and is receivable in said receptacle such that said accessory is mounted removably on said bracket;

and said locking member is movable by said key to a first position in which said locking member is clear of said receptical and thereby permits said projection to be inserted in and removed from said receptacle, and a second position such that said locking member positively engages and retains said projection when inserted in said receptacle whereby said accessory and bracket are rendered inseparable, said operating member being removable from said accessory at least when said locking member is in said second position.

4,711,108

COMBINATION LOCK

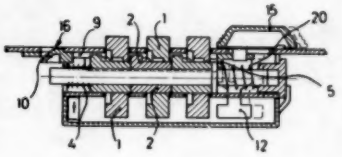
Jose P. Garro, Bo Ventas s/n. Carr., Oyarzun, Irun (Guipuzcoa), Spain

Continuation of Ser. No. 510,083, Jun. 30, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 878,395

Claims priority, application Spain, Jun. 30, 1982, 513.592

Int. Cl.⁴ E05B *37/02*

U.S. Cl. 70—312 **5 Claims**



1. A combination lock having a selectable combination comprising a slidable shaft,

a plurality of sockets rotatable about said slidable shaft, said sockets being axially movable with said shaft and maintaining their relative axial position on said shaft,

a plurality of rollers connected to said sockets wherein each roller has one of said sockets associated therewith,

said sockets and said shaft being axially movable with respect to said rollers, said sockets normally coupled to the roller for common rotation therewith, and when said sockets are moved axially with respect to the rollers said rollers are rotatable about said sockets wherein rotating at least one roller relative to its associated socket varies the combination;

an axially movable frame, means attached to said frame to axially move said frame, said frame being movable when said lock is in an on-key position, said frame being movable in a first direction from a rest position to an unlocking position, said frame also movable in a second direction opposite said first direction from said rest position to a combination-changing position, said frame having means to axially move said slidable shaft and said sockets to disassociate said sockets from said rollers to permit the rotation of said rollers about said sockets and to permit the combination of said lock to be changed;

bolt means attached to the frame, said bolt means including projection means which restrains said frame in the combination changing position once said combination changing position has been attained; and

prong means attached to said frame and engagable by an oscillating bridge means, said oscillating bridge means blocking said prong means when said lock is in an off-key position, wherein said operating means is rendered immobile in said rest position when said prong means is so blocked.

4,711,109

CONTROLLING THICKNESS AND PLANARITY OF HOT ROLLED STRIPS

Wolfgang Rohde, Dormagen, and Jürgen Klöckner, Netphen, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag, A.G., Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 589,409, Mar. 14, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 845,478

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3309040; Jan. 20, 1984, 3401894

Int. Cl.⁴ B21B *37/00*

U.S. Cl. 72—8 **7 Claims**

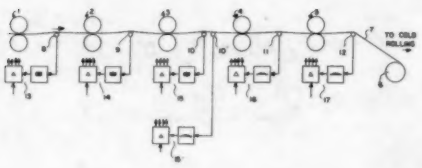
1. A method for hot rolling strip metal comprising the steps of:

(a) determining the critical thickness of the metal in process

at which reductions in thickness do not bring about a substantial increase in width;

(b) hot rolling strip stock of said metal, said stock having a thickness substantially thicker than said crictical thickness, sequentially through a first and second rolling stage in each of which stage said stock is passed through a roll pass comprising at least one deforming nip of at least one roll stand;

(c) reducing the thickness of said stock in said first stage to substantially said critical thickness;



(d) controlling the thickness reduction of said stock in said first stage by sensing the thickness of said stock downstream of said first stage and adjusting the height of said nip at at least the final roll stand in said first stage in response to the thickness measured;

(e) sensing the planarity of said stock at said second stage at at least one point downstream of the roll pass thereof; and

(f) reducing the thickness of said stock in said second stage to a thickness substantially below the thickness of said critical thickness while controlling the roll pass of that stage only in response to said planarity sensor.

4,711,110

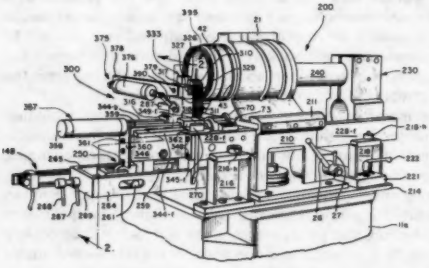
APPARATUS FOR CRIMPING PIPE

Wilhelmus P. H. Castricum, Rolling Meadows, Ill., assignor to Spiro America Inc., Wheeling, Ill.

Filed Oct. 24, 1986, Ser. No. 922,749

Int. Cl.[4] B21D *19/04*

U.S. Cl. 72—49 **20 Claims**



1. For use with a machine for continuously producing spiral seamed pipe from a metal strip including drive means for continuously feeding the strip through the machine, means for forming the strip into a spiral cylinder so that the outer edges of the strip are adjacent each other, means for joining the adjacent edges to produce a pipe having a spiral lockseam, and the leading edge of the continuously produced pipe moving in an axial direction as it rotates, an apparatus for crimping the leading edge of the pipe comprising:

means for holding a plurality of rollers;

first and second rollers rotatably mounted in the holding means adjacent each other, each roller having a corrugated circumferential edge;

guide means for carrying the holding means and being slidable in the axial direction of the pipe;

means for moving the holding means between a first position where the continuously produced pipe can move freely by the holding means and rollers, and a second position where the leading edge of the pipe will pass between the corrugated edges of the first and second rollers; and

means for lifting the first roller towards the second roller when the holding means is in the second position and the leading edge of the pipe is between the rollers, so that the corrugated edges of the rollers cooperate to crimp the pipe's leading edge, and whereby the moving pipe exerts a force on the rollers and holding means which causes the guide means to slide in the axial direction of the pipe, and the pipe's leading edge rotates between the first and second rollers as it moves axially so that the rollers can crimp the circumference of the leading edge.

4,711,111

FORMING PRESS MAT UTILIZES TRAYS FORMED OF THIN BOTTOM PLATES AND SEPARATE ANNULAR FRAMES

Keijo Hellgren, Västerås, Sweden, assignor to Asea AB, Västerås, Sweden

Filed May 30, 1986, Ser. No. 868,432

Claims priority, application Sweden, Mar. 25, 1986, 8601382

Int. Cl.[4] B21P *22/12*

U.S. Cl. 72—63 **4 Claims**

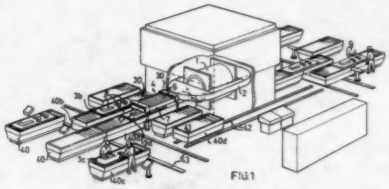


Fig.1

1. An apparatus for pressing work pieces, said apparatus comprising

a forming press of a pressure cell type, said forming press including a press stand having an upper force-absorbing element, a lower force-absorbing element, a press plate having channels for a pressure medium positioned between said upper and lower force-absorbing plates, and a diaphragm positioned between said press plate and said lower force-absorbing element, said diaphragm and said lower force-absorbing element providing a parallelepipedical working space therebetween which has opposite ends that are open,

a tray for carrying forming tools and work pieces into and out of said working space, said tray consisting of a thin bottom plate and a rectangular frame resting on said bottom plate, said frame having thin long sides and thick short ends, said thick short ends acting to close said open ends of said working space when said tray is located in said working space,

transport means for horizontally moving said tray into and out of said working space through the open ends thereof, and

load-absorbing means located outside of said press stand and movable from a first position wherein it blocks at least one of the open ends of said working space to absorb an axial load induced on the short ends of the rectangular frame of said tray when said tray is located in said working space and the diaphragm of said press stand is moved toward said lower force-absorbing element by pressure medium passing through the channels in said press plate, or to a second position wherein it allows full access to the open ends of said working space to enable said tray to be moved into or moved out of said working space.

4,711,112

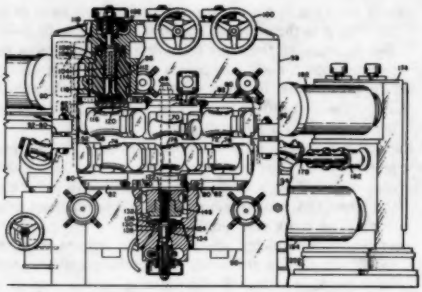
STRAIGHTENING MACHINES AND METHODS

Einar W. Nilsson, 705 E. Curtin St., Bellefonte, Pa. 16823

Continuation-in-part of Ser. No. 280,372, Jul. 6, 1981, Pat. No. 4,494,394. This application Oct. 10, 1984, Ser. No. 659,087

Int. Cl.[4] B21D *3/04*

U.S. Cl. 72—98 6 Claims



1. A method for maintaining stock in a curved pass of a cross-roll straightener having a female roll of larger diameter than an opposed male roll, both of which are normally driven at substantially equal peripheral speeds, said method comprising:

temporarily rotating the smaller male roll at a higher peripheral velocity than the female roll such that the surface speed of the male roll is greater than the surface speed of the female roll and the female roll is driven by engagement with the stock as it enters the roll pass;

driving the female roll by a drive means when the stock has traveled beyond the center of the pass such that the surface speed of the male and female rolls are substantially the same; and

sensing the leading end of the stock and causing a temporary drag on the female roll when the stock is being entered into the pass between said rolls.

4,711,113

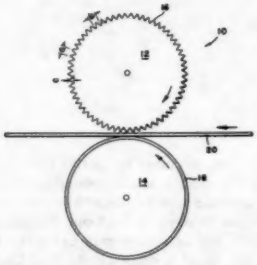
APPARATUS FOR REDUCING CORE LOSSES OF GRAIN-ORIENTED SILICON STEEL

James G. Benford, Pittsburgh, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 714,587, Mar. 21, 1985, abandoned, which is a division of Ser. No. 683,839, Dec. 19, 1984, Pat. No. 4,533,409. This application Jun. 10, 1986, Ser. No. 873,111

Int. Cl.[4] B21B *15/00, 45/00*

U.S. Cl. 72—197 2 Claims



1. An apparatus for improving core loss of grain-oriented silicon steel comprising:

a freely-rotatable roll set through which cold-rolled final gauge silicon steel sheet product is passed for scribing substantially transverse to the rolling direction; the roll set including an anvil roll and a scribing roll;

the scribing roll having a roll surface which includes a plurality of projections thereon in a direction substantially parallel to the axis of the roll, the scribing roll being constructed of metal, the projections being spaced apart from 2 to 10 mm;

the anvil roll having a roll surface for contacting the steel sheet opposite the side being scribed, the surface being constructed from a material that is relatively more elastic than the metal material of the scribing roll, the anvil roll material having a shear modulus of elasticity of 2 to 5×10^2 psi, said rolls being spaced apart at a distance smaller than the steel thickness to effectively scribe the steel to a depth of less than about 6×10^{-3} mm thereby inducing localized strains in the steel surface without overscribing the steel.

4,711,114

METHOD OF AND APPARATUS FOR THE PRODUCTION OF WIDE STRIP

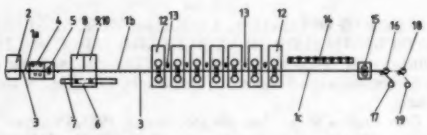
Wolfgang Rohde, Dormagen, and Manfred Kolakowski, Erkrath, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,084

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517090

Int. Cl.[4] B21B *13/08*

U.S. Cl. 72—234 11 Claims



6. An apparatus for producing wide strip, comprising:

means for feeding a succession of roughed-out lengths of strip along a path to a finish-hot-rolling line having a plurality of rolling stands therealong;

means for affixing the successive lengths end to end before said lengths enter the stands of said finish-hot-rolling line to form a continuous band;

means for finish-hot-rolling said strip to a given thickness by passing said band through the stands of said line; and

means for thereafter separating the lengths from one another.

4,711,115

METHOD FOR FORMING MEMORY DISCS BY FORGING

Israil M. Sukonnik; John S. Judge, both of Sidney, Ohio, and Colin H. Kilgore, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 30, 1985, Ser. No. 814,310

Int. Cl.[4] B21D *28/26;* B21K *1/76*

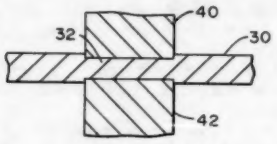
U.S. Cl. 72—329 8 Claims

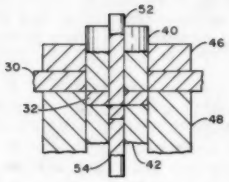
1. A method of making a flat and smooth metal memory disc for a data storage system which comprises:

(a) pressing opposite surfaces of a metal member at a pressure of up to 2,200 KSI to form surfaces characterized by a maximum difference of 50 to 300 micro-inches from the lowest spot to the highest spot and a smoothness defined as Ra equal to or less than 350 Angstroms by flowing the metal member radially outward from a central neutral zone of roughness; and

(b) subsequently removing said neutral zone of roughness formed during said pressing step by forming a central opening in said metal member of a diameter sufficient to remove said neutral zone of roughness;

whereby said memory disc will be formed sufficiently smooth and flat to permit use of said memory disc without further machining of said surfaces to achieve said flatness and smoothness.





4,711,116

METHOD OF OPERATING A FOUR-HIGH ROLL STAND WITH BENDABLE AND AXIALLY SHIFTABLE ROLLS

Wilfried Bald, Hilchenbach, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

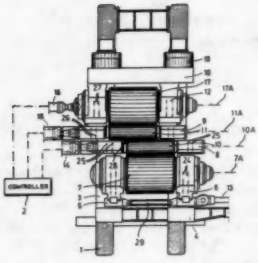
Continuation of Ser. No. 558,165, Dec. 5, 1983, Pat. No. 4,669,296. This application Sep. 25, 1986, Ser. No. 911,959

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3245090

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[4] B21B *31/18, 31/32*

U.S. Cl. 72—366 **3 Claims**



1. A method of operating a four-high roll stand comprising:

a frame;

a pair of small-diameter and substantially parallel work rolls defining a workpiece nip;

respective journal blocks supporting the work rolls in the frame for rotation about substantially parallel axes flanking the nip;

means for axially shifting the work-roll journal blocks and the respective work rolls in the frame;

respective means for bending the work rolls positively and negatively;

a pair of large-diameter and substantially parallel backup rolls flanking and bearing toward the nip on the work rolls;

respective journal blocks supporting the backup rolls in the frame for rotation about substantially parallel axes flanking and generally coplanar with the work-roll axes; and

means for axially shifting the backup-roll journal blocks and the respective backup rolls in the frame; the method comprising the steps of:

axially positioning the backup rolls relative to each other according to the width of a strip workpiece to be rolled and maintaining the same relative axial positions of the backup rolls for all workpieces of equal width;

axially positioning the work rolls relative to each other in a position that differs from their positions during previous strip runs for strips of equal width;

thereafter passing a strip workpiece through the nip perpendicular to the plane of the roll axes while pressing the work rolls against the strip workpiece to reduce its thickness and while maintaining the relative axial position of the work rolls unchanged;

after having completed the run of the strip workpiece, axially displacing the work rolls relative to the next strip workpiece and thereby changing the region of contact between the workpiece edges and the work rolls during a following run with the next strip workpiece; and

bending the work rolls by bending the backup rolls independently of the axial position of the work rolls to such an extent as to generate a predetermined rolled strip profile in the workpieces.

4,711,117

SIDE ARM FLUID LEVEL GAUGE WITH SPACED-APART SENSORS FOR DENSITY ERROR COMPENSATION

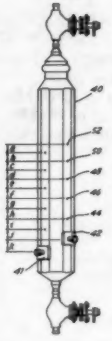
Harry F. Cosser, Fleet, England, assignor to Schlumberger Electronics, Inc., Hants, England

Filed May 6, 1985, Ser. No. 730,537

Claims priority, application United Kingdom, May 16, 1984, 8412460

Int. Cl.[4] G01F *23/02, 23/22*

U.S. Cl. 73—1 H **4 Claims**



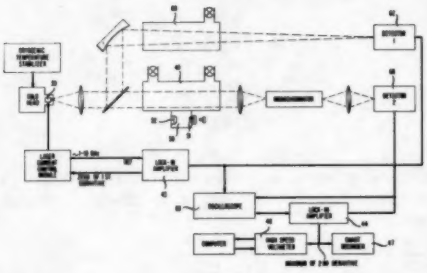
1. Fluid level measurement apparatus for the measurement of fluid level in a container under normal operating conditions comprising: a pressure vessel connected to and communicating with the container through at least one conduit and arranged such that fluid in the container may enter the vessel so that fluid level in the vessel is representative of fluid level in the container; and a plurality of spaced apart fluid sensitive sensors mounted in the vessel, the apparatus calibrated such that spacings between at least two different vertically disposed pairs of sensors are unequal to each other and correspond to and differ from preselected increments of fluid level to be measured,

wherein the calibrated spacings between sensors on the container are selected frrom values determined from known level errors arising from density difference between fluid in the container and fluid in the vessel as a result of temperature and pressure differences in the container and vessel, to compensate for said errors in fluid level measured by said apparatus.

4,711,118
DETECTION OF WATER ENTRAPPED IN ELECTRONIC COMPONENTS

Peter R. Bossard, Langhorne, Pa., and John A. Mucha, Madison, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 5, 1981, Ser. No. 318,330
Int. Cl.[4] G01N *21/00*; G01M *3/00*
U.S. Cl. 73—73 **6 Claims**

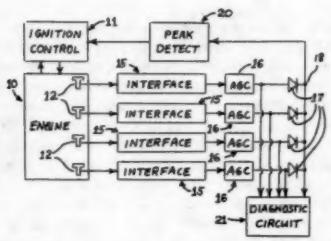


1. A process comprising the steps of (1) choosing a representative sample of devices from a batch of devices (2) measuring the encapsulated water vapor present in said representative sample of devices and (3) accepting said batch if said measured water vapor is less than a chosen value characterized in that from the instant that said water vapor is freed from said device the measurement that determines said water vapor level is made in a time period less than the time required for significant adsorption interaction of water with the walls of the measurement chamber.

4,711,119
PEAK COMBUSTION PRESSURE SIGNAL PROCESSING CIRCUIT WITH DIAGNOSTIC CAPABILITY

Glen C. Hamren, Greentown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 939,184
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—115 **3 Claims**



1. A peak combustion pressure signal processing circuit for an internal combustion engine having a plurality of combustion chambers with combustion pressure sensors comprising, in combination:

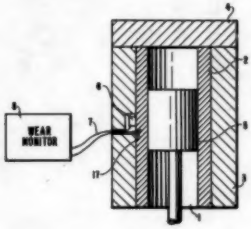
an operational amplifier for each sensor having an input receiving a voltage derived from the sensor and an output connected through a diode to a common junction to produce a voltage representing the highest combustion pressure of the engine at the common junction, each operational amplifier further having a feedback circuit from the common junction to its input effective to cause its output voltage to decrease by more than a diode drop so as to reverse bias its output diode when the voltage on the common junction exceeds the voltage derived from the associated sensor, whereby only the diode passing the signal derived from the sensor sensing the maximum combustion pressure is forward biased and all the other diodes are reverse biased; and

a logic circuit having inputs from the common junction and the outputs of at least all but one of the operational amplifiers, the logic circuit being effective to compare the voltage levels of the outputs of the operational amplifiers to the voltage on the common junction and thus determine which diode is forward biased, the logic circuit further defining a plurality of identifiable output states, one such state being unique to each diode being forward biased.

4,711,120
METHOD OF WEAR MONITORING USING ULTRASONIC PHASE COMPARISON

Hegeon Kwun; Anmol S. Birring; Gurvinder P. Singh; Gary J. Hendrix, and David G. Alcazar, all of San Antonio, Tex., assignors to Association of American Railroads, Washington, D.C.

Filed Oct. 6, 1986, Ser. No. 915,382
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 R **11 Claims**



1. A method of monitoring cylinder wall wear in an engine comprising the steps of introducing ultrasonic waves in cylinder wall of the engine at least at intermittent times during the life of the engine so that the waves travel through the cylinder wall, determining a change in the traveling time of the ultrasonic waves traveling through the cylinder wall due to cylinder wall wear by phase comparison of the traveling ultrasonic waves, and calculating the amount of wear of the cylinder wall by multiplying the velocity of the ultrasonic waves in the cylinder wall by the traveling time change due to cylinder wall wear to thereby provide an indication as to whether engine overhaul or replacement is needed.

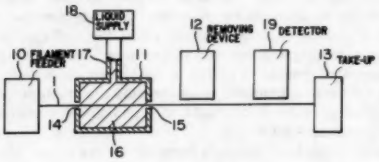
4,711,121
METHOD AND EQUIPMENT FOR DETECTING PINHOLES OF HOLLOW FILAMENT

Yasuteru Tahara, and Kazuyoshi Koike, both of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,430
Int. Cl.[4] G01M *3/00*
U.S. Cl. 73—37.7 **4 Claims**

1. An improved method for detecting a pinhole in a hollow filament, wherein the improvement comprises passing the hollow filament through water maintained at a pressure higher than the pressure in the interior of said hollow filament to allow said water to intrude through any pinhole in said hollow

filament and into the interior of the hollow filament and, through the detection of said intruded water in the interior of



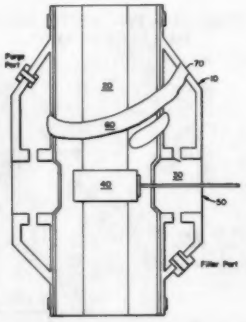
said hollow filament, detecting a pin hole in said hollow filament.

4,711,122

FLEXIBLE MUD EXCLUDER FOR BOREHOLE TELEVIEWER

Jorg A. Angehrn, Brea, and Dennis J. Fischer, Walnut Creek, both of Calif., assignors to Chevron Research Co., San Francisco, Calif.

Filed Aug. 21, 1986, Ser. No. 898,557
Int. Cl.[4] G01V *1/40*
U.S. Cl. 73—151 **7 Claims**



1. A mud excluder fitted around a rotating acoustic transducer of a borehole televiewer to exclude mud from said borehole televiewer, wherein said mud excluder comprises:

(a) a flexible casing means attached to said borehole televiewer to form a fluid cavity adjacent to said rotating acoustic transducer;

(b) an acoustically transparent fluid located within said fluid cavity;

(c) an acoustic window means opposite said transducer and adjacent to said fluid cavity; and

(d) a pressure compensating means within the fluid cavity to equalize the pressure within said fluid cavity with the pressure on the outside of said flexible casing means.

4,711,123

BUNDLE TYPE DOWNHOLE GAUGE CARRIER

Jon B. Christensen, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

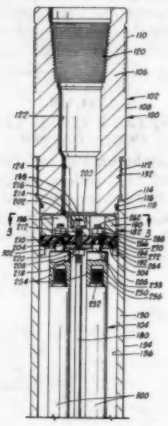
Filed Nov. 25, 1985, Ser. No. 801,656
Int. Cl.[4] E21B *47/06*
U.S. Cl. 73—151 **11 Claims**

9. A method of loading a plurality of gauges in a downhole gauge carrier, comprising:

(a) providing a carrier case assembly having an interior cavity;

(b) providing a support assembly to be removably disposed in said cavity;

(c) securing said plurality of gauges in said support assembly; and



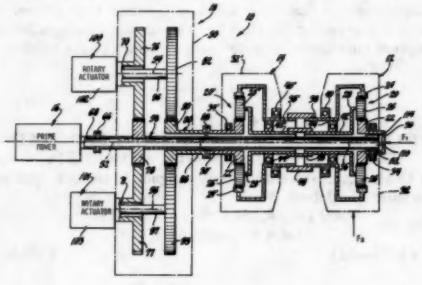
(d) disposing said support assembly with said plurality of gauges secured therein in said interior cavity of said case assembly.

4,711,124

TORQUE APPLIER

Philip V. Cagle, Plainfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1986, Ser. No. 843,495
Int. Cl.[4] G01M *13/02*
U.S. Cl. 73—162 **3 Claims**



1. In an endurance test system for a test gear box of predetermined rated horsepower capacity at a rated input speed having a pair of concentric output shafts and a colinear input shaft,

said test system including a slave gear box having a pair of concentric output shafts aligned with and connected to respective ones of said test gear box output shafts for rotation as units therewith and a colinear input shaft,

rotation of said test gear box input shaft effecting concurrent rotation of said slave gear box input shaft in the same direction and at the same speed and oppositely directed torsional moments on said test gear box input shaft and said slave gear box input shaft simulating torque transfer through said test gear box, and

a prime mover having a horsepower rating not exceeding about ten percent of said test gear box rated horsepower and a power shaft aligned with said test gear box input shaft and said slave gear box input shaft and rotatable at said test gear box rated input speed,

a torque applier comprising:

a torque applier housing disposed between said prime mover and said test gear box and defining a main axis,

a torque applier main shaft means aligned on said main axis and extending through said torque applier housing drivingly connecting said prime mover power shaft and said test gear box input shaft whereby said test gear box input shaft is rotated at said rated input speed,

an intermediate shaft means on said housing rotatable about said main axis,

means connecting said intermediate shaft means and said slave gear box input shaft for unitary rotation,

a plurality of rotary actuators each having a housing and a center shaft interconnected by means operative to develop equal and opposite torsional moments between

respective pairs of said housings and said center shafts while said housings and said center shafts rotate in the same direction at the same speed,

means mounting each of said rotary actuators on said torque applier housing in a circumferential array around said main axis,

first combining gear means within said torque applier housing between said main shaft means and each of said rotary actuator housings rotating each of said rotary actuator housings at a reduced speed relative to said main shaft means, and

second combining gear means on said torque applier housing between said intermediate shaft means and each of said rotary actuator center shafts rotating each of said rotary actuator center shafts at the same speed as said rotary actuator housings and in the same direction,

said first and said second combining gear means simultaneoulsy multiplying and summing the torsional moments developed by each of said rotary actuators while said test and said slave gear box input shafts rotate thereby to simulate torque transfer through said test gear box at said rated input shaft speed.

4,711,125

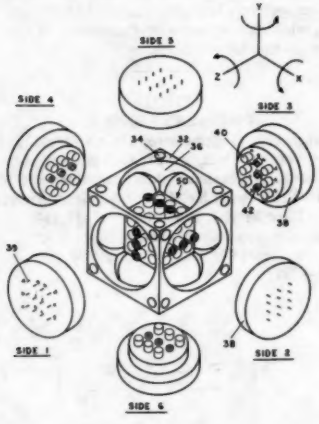
INERTIAL MEASUREMENT UNIT

Melvin M. Morrison, 6530 Independence Ave. #207, Canoga Park, Calif. 91303

Filed Nov. 6, 1985, Ser. No. 795,456

Int. Cl.[4] G01C *21/12*

U.S. Cl. 73—178 R **19 Claims**



1. An apparatus for use in an inertial measurement unit for sensing motion in plural independent mutually orthogonal linear axes and plural independent mutually orthogonal angular axes of operation comprising:

an outer assembly having a plurality of parallel opposing interior surfaces and a sensor mass disposed within said outer assembly, said outer assembly including:

a first set of suspension elements for suspending said sensor mass along each axis of operation including two face-to-face suspension elements disposed on opposing interior surfaces of said outer assembly and

a first set of sensing elements for sensing motion of said outer assembly relative to said sensor mass along each axis of operation including two face-to-face pairs of sensing elements, each pair of elements being disposed on opposing interior surfaces of said outer assembly, with the corresponding suspension elements disposed between each pair of sensing elements and

said sensor mass including:

a second set of suspension elements cooperative with said first set of suspension elements to suspend said sensor mass relative to said outer assembly along each axis of operation including two back-to-back suspension elements on opposing exterior surfaces of said sensor mass and

a second set of sensing elements cooperative with said first set of sensing elements to sense motion of said sensor mass relative to said outer assembly along each axis of operation including two back-to-back pairs of sensing elements each pair of sensing elements being disposed on opposing exterior surfaces of said sensor mass with the corresponding suspension element disposed between each pair of sensing elements

whereby each suspension element and each sensing element on the sensor mass faces a corresponding suspension or sensing element respectively of said outer assembly such that the sensor mass is suspended within the outer assembly for movement in said axes of operation mechanically independent thereof.

4,711,126

SENSOR FOR THE MEASUREMENT OF THE REFRACTIVE INDEX OF A FLUID AND/OR PHASE BOUNDARY BETWEEN TWO FLUIDS BY MEANS OF VISIBLE OR INVISIBLE LIGHT

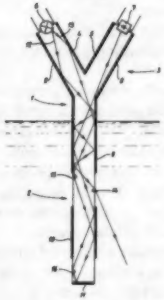
Pieter M. Houpt, and Ralph T. Wielandt, both of The Hague, Netherlands, assignors to 501 Nederlandse Centrale Organisatie Voor Toegepast-Enschappelijk Onderzoek, The Hague, Netherlands

Filed Mar. 12, 1986, Ser. No. 838,675

Claims priority, application Netherlands, Mar. 13, 1985, 8500726; Oct. 8, 1985, 8502744

Int. Cl.[4] G01F *23/28*

U.S. Cl. 73—293 **17 Claims**



1. A rechargeable battery comprising a rechargeable fluid-containing cell and a sensor for obtaining measurements of at least one fluid associated with said cell, the sensor comprising

a light guide having a refractive index greater than that of the fluid, the light guide being a fork-shaped rod having a

portion at one end thereof adapted for immersion in the fluid, the opposite end of the rod being adapted for connection thereto a light source for directing visible or invisible light into the light guide and means for detecting reflected light,

a cladding bonded to the peripheral surface of the rod, the cladding comprising a coating of reflective material, and

one or more window cut outs in the reflective coating bonded to the portion of the rod adapted for immersion in the fluid, whereby when the rod is immersed, the windows are in direct contact with the fluid.

4,711,127

METHOD AND APPARATUS FOR MEASURING THE PRESSURE OF A FLUID

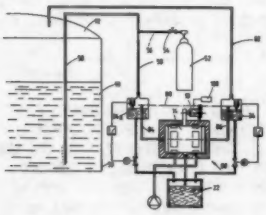
Hans W. Häfner, Aichach-Walchshofen, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,650

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514911

Int. Cl.[4] G01F *23/14;* G01L *7/16*

U.S. Cl. 73—302 **31 Claims**



8. An apparatus for determining the height, volume, density and/or mass of liquid contained in a storage tank, comprising:

(a) a piston having two opposite face surfaces, slidably guided in a cylinder essentially without friction by hydrostatic bearings;

(b) a means for supplying, under pressure, hydrostatic liquid to said hydrostatic bearings;

(c) a gas supply means;

(d) at least one bubble tube means connectable to said gas supply means for releasing gas into said liquid at a predetermined level;

(e) at least one pressure chamber formed within said cylinder, one wall of said pressure chamber being a face surface of said piston, said pressure chamber having applied thereto a pressure existing in said bubble tube when supplied with gas from said gas supply means;

(f) a force measuring element engaging said piston and adapted to generate a signal indicative of the pressure existing in said bubble tube means;

(g) at least one receptacle connected to said pressure chamber for receiving any of said hydrostatic liquid that penetrates into said pressure chamber;

(h) a means for controlled removing of hydrostatic liquid from said receptacle such that said hydrostatic liquid is maintained at a predetermined level in said receptacle; and

(i) evaluation means for calculating on the basis of said signal said height, volume, density and/or mass of said liquid in said storage tank.

4,711,128

MICROMACHINED ACCELEROMETER WITH ELECTROSTATIC RETURN

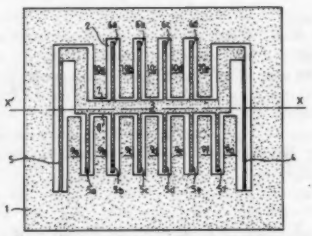
André Boura, Chatellerault, France, assignor to Societe Francaise d'Equipements pour la Aerienne (S.F.E.N.A.), France

Filed Apr. 14, 1986, Ser. No. 851,639

Claims priority, application France, Apr. 16, 1985, 85 05690

Int. Cl.[4] G01P *15/13, 15/125*

U.S. Cl. 73—517 B **9 Claims**



1. An accelerometer sensor comprising a flat pendular structure made from one and the same crystalline wafer, said structure having in a same plane, a flat fixed part, at least two parallel blades flexible in the same plane and delimiting therebetween a space, each of said blades having a first end portion fixedly connected to said fixed part, and a second end portion, said structure further comprising a flat test body connected to the second end portions of said blades so as to be suspended from the flat fixed part and to be able to move in translation in the same plane along a sensitive axis under the effect of an acceleration with a position which varies in relation with said acceleration, said flat test body extending at least partially into said space, wherein said flat test body comprises at least a first edge which carries a first metallization having first and second opposite faces and said flat fixed part comprises at least a second and a third edge carrying respectively a second and a third metallizations, said second and third metallizations respectively facing said first and second opposite faces, so as to form two capacitors whose capacities vary depending on the position of said test body, said first metallization being brought to a first voltage V_0, whereas the second and the third metallizations are respectively brought to a second and third voltages V_1 and V_2 which are capable of generating an electrostatic return force on the flat test body.

4,711,129

PRESSURE SENSOR

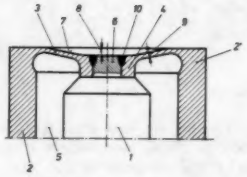
Johann Stubenberg, Gleichenberg; Heimo Denk, and Rudolf Zeiringer, both of Graz, all of Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List, Graz, Austria

Filed Mar. 3, 1986, Ser. No. 835,214

Claims priority, application Austria, Mar. 5, 1985, 655/85

Int. Cl.[4] G01L *7/08, 19/04*

U.S. Cl. 73—708 **2 Claims**



1. A pressure sensor comprising a housing which defines an

interior, a measuring element situated in the interior of said housing, and a plate membrane which has a center area, an annular area around the center area and a peripheral area around the annular area, said peripheral area of said plate membrane being permanently attached to said housing such that said housing is sealed against a medium whose pressure is to be measured, said plate membrane also being connected to said measuring element so as to transmit the pressure to be measured to said measuring element, adjacent to its periphery along which it is connected to said housing having an annular area bordering on a center area, and said annular area of said plate membrane, in its unloaded condition, having a curved or conical shape and extending into the interior of said housing, and said annular area of said plate membrane being higher in its non-assembled state than after assembly, such that it is pressed against said measuring element with a positive pretension in its assembled state.

4,711,130

PRESSURE MEASURING ELEMENT

Hans J. Glas, Tamm; Hans Hecht, Korntal-Münchingen; Klaus Müller, Tamm; Kurt Spitzenberger, Weil der Stadt, and Günther Stecher, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,006

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528520

Int. Cl.⁴ G01L *7/08, 9/12, 19/04*

U.S. Cl. 73—708 **7 Claims**

1. In a pressure measuring element, particularly for measuring intake air pressure in an internal combustion engine of a motor vehicle, comprising a membrane made of ceramic material and deformable in response to an intake air pressure; and a substrate formed as a plate and having an upper side to which said membrane is rigidily connected at a peripheral area thereof, said substrate having an underside; the improvement comprising an electrical heating resistance element mounted immediately on said underside, whereby said substrate is maintained at constant temperature.

4,711,131

METHOD AND APPARATUS FOR DETERMINING CRACK INITIATION AND PROPAGATION IN METALS

Daniel N. Hopkins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1986, Ser. No. 815,847

Int. Cl.⁴ G01N *19/00*

U.S. Cl. 73—799 **51 Claims**

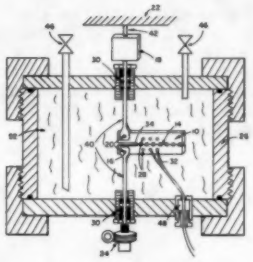
1. An apparatus with an enclosed environment conducive to crack initiation and propagation comprising:

(a) means for supporting a metal specimen in said enclosed environment;

(b) a specimen of a generally rectangular planar and cross sectional configuration having two longitudinal arms with a space therebetween for a substantially short distance terminating in oppositely disposed longitudinal grooves for the remainder of the distance therebetween which grooves define a narrowed longitudinal section;

(c) means for applying a force, while said specimen is in said enclosed environment by a rod means interconnected to each of said arms in combination with said enclosed environment, sufficient to initiate and propagate a longitudinal crack in said longitudinal section; and

(d) a means for detecting strain via strain sensors and a mean for measuring said detection results from said crack initiation and propagation in said specimen which enables the



prediction of the metal behavior under actual conditions of use.

4,711,132

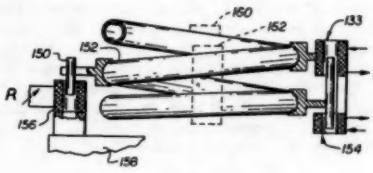
APPARATUS FOR MASS FLOW RATE AND DENSITY MEASUREMENT

Erik B. Dahlin, San Jose, Calif., assignor to Exac Corporation, Campbell, Calif.

Continuation-in-part of Ser. No. 616,808, Jun. 4, 1984, abandoned and PCT US85/01046 filed Jun. 3, 1985, published as W085/05677, Dec. 19, 1985. This application Sep. 13, 1985, Ser. No. 775,739

Int. Cl.⁴ G01F *1/84*

U.S. Cl. 73—861.38 **20 Claims**



1. A flow meter for measuring the mass flow rate in a stream of flowing material, comprising:

tubular conduit means arranged to form at least one loop having an entrance portion, an exit portion crossing said entrance portion in spaced apart relationship, an actuated portion, a first detection portion coupling said entrance portion and said actuated portion, and a second detection portion coupling said actuated portion and said exit portion, said conduit means being adapted to receive, conduct and then emit said stream of flowing material and having a natural frequency of oscillation in the Coriolis mode of w_C and a natural frequency of oscillation in the drive mode of w_D, where w_D is substantially different from w_C;

actuating means for causing said actuated portion to oscillate between positions on opposite sides of a rest position;

damping means coupled to said tubular conduit means for allowing selective adjustment of the damping coefficient thereof;

detection means for detecting motive differences occurring between said entrance portion and said exit portion caused by Coriolis forces induced in said first detection portion of said second detection portion as said actuating means causes said actuated portion to oscillate; and

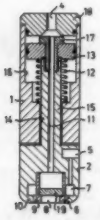
computing and indicator means responsive to said detection means and operative to indicate the mass flow rate of material flowing through said tubular conduit means.

4,711,133

NON-CONTACT WEB TENSION METER

Per Roode Berglund, Musserongängen 18, S-13534 Tyresö, Sweden

PCT No. PCT/SE85/00319, § 371 Date May 9, 1986, § 102(e) Date May 9, 1986, PCT Pub. No. WO86/01890, PCT Pub. Date Mar. 27, 1986
PCT Filed Aug. 28, 1985, Ser. No. 862,351
Claims priority, application Sweden, Sep. 10, 1984, 8404531
Int. Cl.[4] G01L 5/08
U.S. Cl. 73—862.07 6 Claims



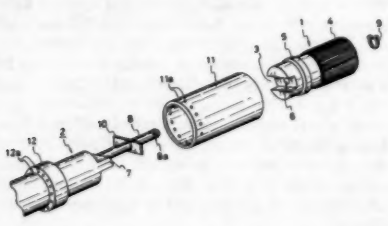
1. A non-contact web tension meter for measuring the tension of a web of material having a breadth and drawn under tension between two guide means, said meter incorporating means for supplying a pressurized gas to a space therein which is open in one direction and which is delimited by one side of said web placed in close proximity to said space, and a pressure gauge adapted to measure the gas pressure near said web at a side of said space, said meter being freely movable across the breadth of said web, and comprising a holder (3), having a measuring head attached to said holder and incorporating a pressurized-gas inlet (4), a gas passage (11) connected to said inlet and extending to said space (8), and an annular chamber (7) surrounding said space (8), and having an annular opening (9), said space (8) and said opening (9) terminating adjacent an end plane in said measuring head, and said annular chamber being connected to a pressure sensor.

4,711,134

TORQUE DETECTOR

Toru Kita, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 9, 1985, Ser. No. 764,075
Claims priority, application Japan, Aug. 13, 1984, 59-123856[U]
Int. Cl.[4] G01L 3/10
U.S. Cl. 73—862.36 9 Claims



1. A torque detector for detecting torque transmitted between first and second shafts with their axes on the same line comprising:

stopper means for preventing angular relative movement between the first and second shafts beyond a predetermined value;

said stopper means having a groove diametrically disposed in the first shaft at one end thereof and a projection disposed in the second shaft at one end thereof, the projection being fitted into the diametric groove;

a magnetostrictive member for transmitting torque between the first and second shafts and coupled in a flexible manner to at least one of the first and second shafts; and

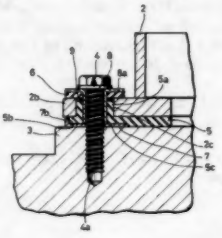
a magnetic sensor for detecting magnetic variations produced in said member by the transmitted torque.

4,711,135

VIBRATION DAMPING STRUCTURE OF SHIFT LEVER RETAINER

Yusuke Horiuchi, and Masaki Inui, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 20, 1985, Ser. No. 800,048
Claims priority, application Japan, Dec. 10, 1984, 59-187866[U]
Int. Cl.[4] G05G 9/12
U.S. Cl. 74—473 R 2 Claims



1. In a shift lever retainer mounting structure including a shift lever retainer for spherically supporting a shift lever, a first vibration damping member interposed between said shift lever retainer and a transmission case, a bolt for fixing said shift lever retainer to said transmission case, a second vibration damping member interposed between said bolt and said shift lever retainer, and a bushing for receiving said bolt, said bushing having an upper flange arranged between a head portion of said bolt and said second vibration damping member, said first and second vibration damping members having a thickness such that vibration from said transmission case may be sufficiently absorbed;

a vibration damping structure comprising a first stopper means for preventing horizontal deformation of said first vibration damping member greater than a predetermined amount, and a second stopper means for preventing vertical deformation of said first vibration damping member greater than a predetermined amount, wherein said first stopper means comprises a rigid ringlike member engaged with said bushing and located between said first and second vibration damping members, and wherein said second stopper means comprises an upward projection projecting from a plate engaged with said bolt and fixed on an upper surface of said transmission case such that a portion of said plate is interposed between said first vibration damping member and said transmission case.

4,711,136

POWER TRANSFER DEVICE FOR FOUR-WHEEL DRIVE

Toshio Yoshinaka; Toshikatsu Taniguchi; Shuichiro Ida; Shuji Nagano; Shigeru Kimura, and Yasuo Tanaka, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 7, 1986, Ser. No. 837,268
Claims priority, application Japan, Mar. 12, 1985, 60-48920
Int. Cl.[4] F16H 37/06; B60K 23/08
U.S. Cl. 74—665 GA 11 Claims

5. A power transfer device adapted for use in cobmination

with a power transmission for an automotive vehicle, comprising:

a housing;

an input shaft rotatably mounted within said housing for connection to an output shaft of said power transmission;

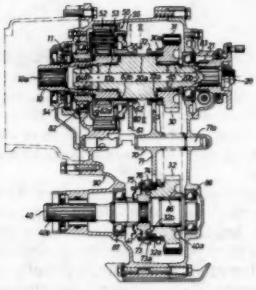
a first output shaft rotatably mounted within said housing coaxially with said input shaft, said first output shaft having an inner end rotatably coupled within said input shaft and having an output end for drive connection to a pair of rear-wheel or front-wheel axles;

a second output shaft rotatably mounted within said housing in parallel with said first output shaft and having an output end for drive connection to a pair of front-wheel or rear-wheel axles;

a drive member rotatably mounted on said first output shaft and connectable to said first output shaft;

a driven member rotatably mounted on said second output shaft and connectable to said second output shaft, said driven member being drivingly connected to said drive member;

a change-speed mechanism mounted on said input shaft and having an input element connected with said input shaft



and an output element for providing a low speed drive power train;

a first changeover mechanism including a clutch sleeve mounted on said first output shaft between said changes-peed mechanism and said drive member and shiftable between a first position wherein said clutch sleeve is retained to directly connect the input shaft to said first output shaft and a second position where said clutch sleeve is retained to connect the output element of said change-speed mechanism to said first output shaft; and

a second changeover mechanism including a pair of second clutch sleeves each mounted on said first and second output shafts respectively and arranged adjacent said drive and driven members, said second clutch sleeves being shiftable between a first position where both said second clutch sleeves are retained to connect said drive and driven members to said first and second output shafts respectively for rotation therewith and a second position where both said second clutch sleeves are retained to disconnect said drive and driven members from said first and second output shafts respectively, wherein said drive and driven gears remain substantially stationary as said first and second shafts rotate.

4,711,137

MECHANICAL AUTOMATIC TRANSMISSION

Walter E. Welander, P.O. Box 449, Virginia, Minn. 55792

Filed Dec. 16, 1985, Ser. No. 809,206

Int. Cl.⁴ F16H *3/74*

U.S. Cl. 74—751 **5 Claims**

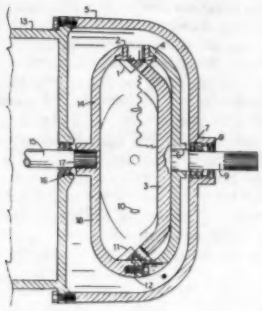
1. Power transfer apparatus comprising:

(a) a first lubricant containing housing:

(b) a second housing rotatively mounted in said first housing including a pair of concave mating halves joined together to form a hollow interior cavity;

(c) an input shaft rotatively journaled through said first housing and spline coupled to one side of said second housing;

(d) a plurality of planetary gears rotatively mounted to project interiorly of said second housing;



(e) a side differential gear of a diameter substantially the same as said second housing and including a plurality of teeth mounted in intermeshed engagement with each of said planetary gears; and

(f) an output shaft fixedly coupled to said side differential gear and rotatively journaled through said first and second housings.

4,711,138

AUTOMATIC TRANSMISSION MECHANISM

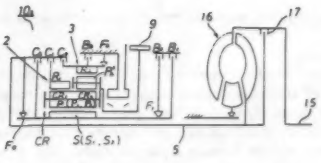
Masakatsu Miura, Kariya, and Hideyuki Aoki, Anjo, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Filed Feb. 26, 1986, Ser. No. 833,377

Claims priority, application Japan, Oct. 16, 1985, 60-230809; Dec. 16, 1985, 60-282584

Int. Cl.⁴ F16H *57/10*; F16D *25/10*

U.S. Cl. 74—761 **7 Claims**



7. An automatic transmission mechanism comprising:

a single planetary gear unit;

a dual planetary gear unit;

carriers of both of the planetary gear units that are connected to one another;

sun gears of both of the planetary gear units that are connected to one another;

an output member to which the carriers are connected;

an input member connected to a ring gear of the single planetary gear unit through a first clutch, to the sun gears through a second clutch, and to a ring gear of the dual planetary gear unit through a third clutch;

brake means for braking rotation of the sun gears, and the ring gear of the dual planetary gear unit;

a hydraulic actuator for actuating the first, the second and the third clutches,

the clutches and the hydraulic actuator being disposed at an

end portion of the hydraulic automatic transmission mechanism;

the hydraulic actuator having a flange portion,

the flange portion comprising a cylinder of the hydraulic actuator for actuating the first clutch, another cylinder of the hydraulic actuator for actuating the third clutch, and a connecting member for connecting the input member to the respective clutches,

the flange portion having a non-rotatable movable member for moving in an axial direction that extends along an axis of the automatic transmission mechanism,

the movable member comprising a piston of the hydraulic actuator for actuating the first clutch, and a cylinder of the hydraulic actuator operatively connected to the second clutch for actuating the second clutch,

the movable member having a piston member that is movable in the axial direction,

the piston member comprising a piston of the hydraulic actuator for actuating the second clutch; and

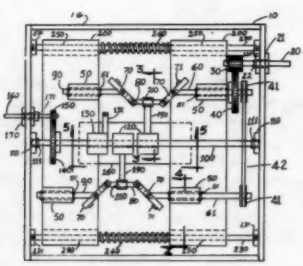
a return spring for biasing the piston member, the return spring biasing the hydraulic actuator for actuating the first and the second clutches to a return position.

4,711,139

INFINITELY VARIABLE ROTARY DRIVE TRANSMISSION

Egas J. Desousa, 8373 Meadowdale, Grand Blanc, Mich. 48439

Filed Jun. 11, 1986, Ser. No. 873,593
Int. Cl.[4] F16H *35/08*
U.S. Cl. 74—837 **8 Claims**



1. An infinitely variable rotary drive transmission comprising:

a housing,

an input member rotatably mounted to said housing,

a pair of articulated drive shafts mounted for rotation within said housing, each of said pair of drive shafts rotatable about longitudinal axis and having a crank portion, said crank portion having a pair of ends, each of said pair of ends of said crank portion pivotally mounted to a link member, said crank portion being radially movable to and away from said longitudinal axis to vary the throw of said crank portion;

means for drivingly connecting said input member to one of said pair of drive shafts;

means for drivingly connecting said pair of drive shafts together for sychronous rotation of said pair of drive shafts;

means for reciprocally moving said crank portion to and away from said longitudinal axis of each of said pair of drive shafts,

an intermediate shaft rotatably mounted to said housing;

a pair of overrunning clutch assemblies mounted to said intermediate shaft such that said shaft rotates in only one direction;

means for drivingly connecting said crank portion of each of said pair of drive shafts to said a respective one of said pair of overrunning clutch assemblies of said intermediate shaft, for continuous revolution of said intermediate shaft, each said crank portion alternately driving said intermediate shaft for one half revolution of said pair of drive shafts, said means for drivingly connecting said crank portion of each of said pair of drive shafts acting in response to a change in the throw of said crank portion of each of said pair of drive acting to vary the speed of rotation of the intermediate shaft;

an output member rotatably connected to said housing; and

means for drivingly connecting said intermediate shaft to said output.

4,711,140

THROTTLE VALVE SYSTEM FOR AUTOMATIC TRANSMISSIONS

Gilbert W. Younger, 2621 Merced Ave., El Monte, Calif. 91733

Filed Dec. 27, 1985, Ser. No. 813,729
Int. Cl.[4] B60K *41/06, 41/16*
U.S. Cl. 74—865 **13 Claims**

1. A throttle valve system for automatic transmissions including a throttle valve member movable within a bore between two predetermined positions, a plunger for driving the throttle valve member in said bore, a throttle valve spring disposed between the plunger and the valve member for transmitting the force exerted by the plunger to the throttle valve member, and

a rigid spacer element freely mounted within the throttle valve spring, said spacer element being of a length less than the length of said throttle valve spring when said spring is in its normal operative position, said spacer element adapted to exert a force directly on said throttle valve member if said valve member sticks in said bore and is no longer movable with said throttle valve spring, said spacer element directly abutting against said valve member and applying a force thereagainst, under the urging of said plunger, only if said valve member is stuck in said bore and said throttle valve spring is compressed to a length substantially equal to the length of said spacer element, said spacer element not directly abutting against said valve member during normal operation of said throttle valve system.

4,711,141

METHOD FOR CONTROLLING AMT SYSTEM INCLUDING AFTER TRANSMISSION GEAR CHANGE CLUTCH AND FUEL CONTROL

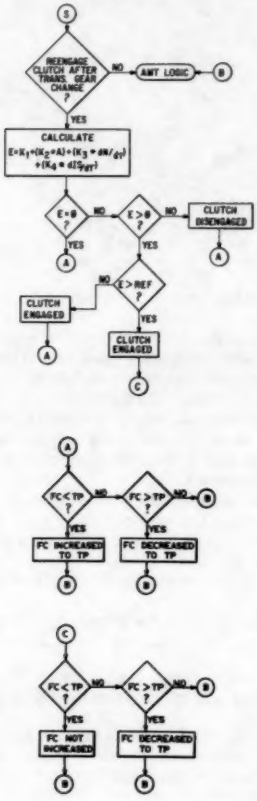
Donald Speranza, Canton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 30, 1986, Ser. No. 858,131
Int. Cl.[4] B60K *41/02, 41/28*
U.S. Cl. 74—866 **10 Claims**

1. A method for controlling a vehicle automatic mechanical transmission system for devices having an operator actuated throttle pedal, a throttle-controlled engine, a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft and a transmission output shaft, said transmission input shaft being operatively connected to said engine by means of a selectably engageable and disengageable friction coupling, said automatic mechanical transmission system comprising an information processing unit having means for receiving a plurality of input signals including (1) an input signal indicative of the rotational speed of the engine; (2) an input signal indicative of the operator's setting of the throttle pedal; and (3) an input signal indicative of the rotational speed of the input shaft, said processing unit including means for processing said input signals in accordance with

a program for generating output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission system effective to actuate said transmission system to effect engagement of said gear ratio combinations in response to said output signals from said processing unit,

said processing unit having means to sense friction coupling engagement after a transmission gear change operation and, in a friction coupling engagement after a transmission gear change operation, issuing output signals to control means for controlling the amount of engagement of said friction coupling, said control means having a first state in which said friction coupling is completely disengaged, a second state in which said friction coupling is completely engaged and a third state occurring during the transition



from said first state to said second state, when said friction coupling engageable elements are partially engaged, said control means being operative during said third state to engage said coupling elements sufficiently to maintain the speed of rotation of said engine at a value in predetermined relation to the adjustment position of said throttle whereby the function E is minimized where E is a function of the throttle position, rate of change of engine speed and rate of change of input shaft speed; the method characterized by:

calculating the value of E;

comparing the value of E to a predetermined reference value; and

preventing increased supply of fuel to the engine, regardless of the throttle pedal setting, if E is equal to or greater than said reference value.

4,711,142

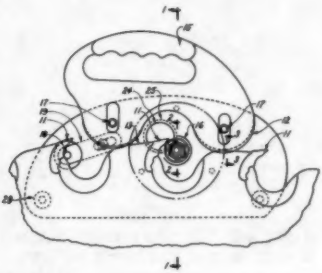
SAW SHARPENING APPARATUS

Anthony J. Pawlosky, R.D. #1, Hickory, Pa. 15340

Continuation-in-part of Ser. No. 855,721, Apr. 25, 1986, abandoned. This application Jan. 22, 1987, Ser. No. 5,789

Int. Cl.[4] B23D *63/14*

U.S. Cl. 76—37 **9 Claims**



1. A hand-held, motor driven apparatus for sharpening saw blades consisting of a body member having a slotted opening partially therethrough such that said body member will straddle a saw blade to be sharpened in a saddle back manner to provide a side shield on each side of said saw blade adjacent to the tooth on said saw blade being sharpened, a motor attached to said body member such that the shaft on the motor extends transversely into the slotted opening, and a cylindrical grinding drum secured over the motor shaft as will provide a hollow ground sharpening action on the teeth of the saw blade being sharpened.

4,711,143

ROCK BIT ASSEMBLY METHOD

Jesse J. Loukanis, Houston, Tex.; Will W. Mathews, Germantown, Tenn., and Raymond L. Tune, Houston, Tex., assignors to NL Industries, Inc., New York, N.Y. and Cummins Engine Co., Columbus, Ind.

Filed Jul. 25, 1986, Ser. No. 890,718

Int. Cl.[4] E21B *10/08*

U.S. Cl. 76—108 A **59 Claims**

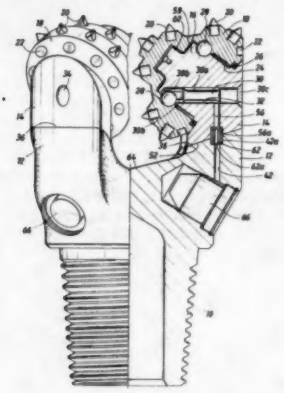
1. A method of assembling a roller cone type rock bit comprising the steps of:

on a main body member having a tool joint portion adjacent one end and at least one leg portion adjacent the other end, providing said leg portion with a longitudinally outer surface which is inclined longitudinally inwardly from its radially outer extremity to its radially inner extremity;

on a base for a cone assembly, providing an end surface configured to mate with said outer surface of said leg portion of said main body member;

rotatably mounting a roller cone on said base distal said end surface to form a cone assembly;

mating said end surface of said base with said outer surface of said leg portion;



and welding said base to said leg portion along the juncture of said mating surfaces to mount said cone assembly on said leg portion.

4,711,144

DRILL BIT AND METHOD OF MANUFACTURE

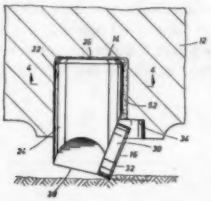
John D. Barr, Cheltenham, and Haydn R. Lamb, Gloucester, both of United Kingdom, assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 575,555, Jan. 31, 1984, Pat. No. 4,605,157. This application Jun. 3, 1986, Ser. No. 870,075

The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.[4] E21B *10/58*

U.S. Cl. 76—108 A **13 Claims**



1. A method of mounting a cutter device having a stud portion defining one end thereof and a cutting formation generally adjacent the other end, in a pocket in a drill bit body member, said method comprising the steps of:

installing spring means cooperative between said cutter device and said bit body member for retaining said stud portion in said pocket; said spring means being orinted so as to resiliently urge said stud portion toward a trailing side of said pocket.

then brazing said stud portion into said pocket.

6. A well drilling bit body member having a working face and a plurality of pockets extending into said working face, each of said pockets having wall means with leading and trailing portions with respect to an intended direction of rotation of said bit body member in use;

a plurality of cutter devices each having a stud portion defining one end thereof and a cutting formation generally adjacent the other end, each of said cutter devices having its stud portion disposed in a respective one of said pockets in abutment with said trailing portion of said wall means;

spring means in each of said pockets generally adjacent said leading portion of said wall means and cooperative between said wall means and said cutter device; for resiliently urging said stud portion toward said trailing portion during brazing and

braze material in each of said pockets between said stud portion of said cutter device and said wall means affixing said cutter device to said bit body member.

4,711,145

RATCHET HANDLE

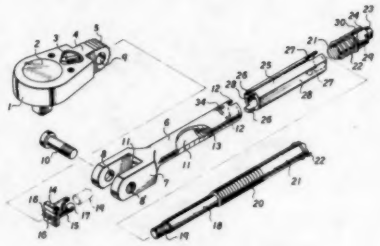
Isao Inoue, 11-14, Sanchiku 1-chome, Sanjo-shi, Niigata-ken, Japan

Filed Aug. 19, 1986, Ser. No. 897,856

Claims priority, application Japan, Jul. 24, 1986, 61-174546

Int. Cl.[4] B25B *23/16*

U.S. Cl. 81—177.1 **6 Claims**



1. A ratchet handle comprising

a head,

a handle connected to said head by a pin,

an operation rod having inner, central and outer portions,

said operation rod having said inner and central portions located within said handle,

said operation rod having first threads on said inner portion and second threads on said central portion,

a moving part having threads engaging said first threads on said operation rod,

said handle having threads in engagement with said second threads on said operation rod,

means for providing a locking engagement between said moving part and said head,

said first and second threads being formed in opposite directions, and

a grip enclosing said outer portion of said operation rod.

4,711,146

METHOD FOR REPROFILING PROFILES OF WHEEL SETS

Dieter Lung, Herzogenrath; Werner Kluft, Aachen; Jochen Fabry, Rückersdorf; Helmut Wittkopp; Theodor Dombrowski, both of Erkelenz, and Hartwig Klosterhalfen, Düren, all of Fed. Rep. of Germany, assignors to W. Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Continuation of Ser. No. 732,440, May 9, 1985, abandoned. This application Mar. 17, 1987, Ser. No. 27,994

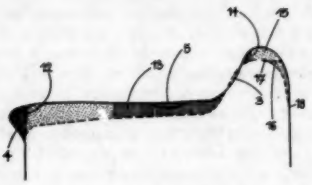
Claims priority, application European Pat. Off., May 10, 1984, 84105312.7; Mar. 22, 1985, 85103378.7

Int. Cl.[4] B23B *5/28*

U.S. Cl. 82—1 C **3 Claims**

1. Method for reprofiling profiles of wheel sets by machining with a lathe using cutting data, which comprises providing cutting data specific to the profile with a machine control unit (43-50), visually subdividing the profile of the wheel sets into regions where cutting materials are not expected to be subjected to a sudden load and remaining regions, rotating the wheel sets, reprofiling the wheel sets by alternating machining the profile using heavy-duty cutting materials at the regions of

the profile where a sudden load is not expected and using shock-insensitive cutting materials at the remaining regions,



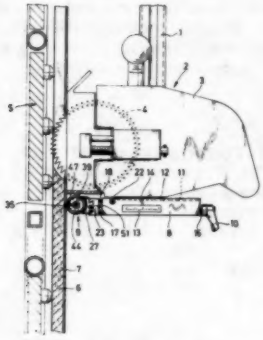
and adapting the cutting data to the cutting material being used at each moment with the machine control unit (43–50).

4,711,147

DEVICE FOR SCORING WORKPIECES

Alfred Dettelbach, and Werner Binder, both of Stuttgart, Fed. Rep. of Germany, assignors to Reich Spezialmaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 26, 1985, Ser. No. 813,517
Int. Cl.[4] B27B *5/06*
U.S. Cl. 83—863 **10 Claims**



1. An apparatus for scoring laminated workpieces, comprising:

sawing means mounted in a frame relative to the workpiece, for cutting the workpiece along a saw line;

scoring head mounted on a slidable and lockable holder substantially normal to a workpiece surface, said holder affixed to said frame with said scoring head positioned to precede said sawing means along a saw line cut into said workpiece surface;

a pair of opposed, adjustably spaced scoring knives, each individually held by said scoring head against the workpiece under pressure, penetrating said surface thereof, said scoring knives characterized by opposed, beveled interior surfaces and flat exterior surfaces,

a pair of knife carriers for transversely adjusting said knife spacing relative to said saw line cut, each of said knife carriers being held by a screw adjustable slide guiding means; and

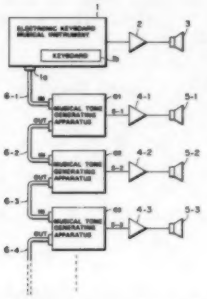
each of said knife carriers being screw clampable on said scoring head means and connected to each other by adjusting screw mechanisms having threaded sections of different pitch engaging said knife carriers.

4,711,148

FRACTIONAL RANGE SELECTABLE MUSICAL TONE GENERATING APPARATUS

Fumiteru Takeda; Katsuhiko Hirano, and Yoshihiro Inagaki, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 13, 1985, Ser. No. 797,442
Claims priority, application Japan, Nov. 14, 1984, 59-172779[U]
Int. Cl.[4] G10H *1/18, 1/36*
U.S. Cl. 84—1.01 **9 Claims**



9. In a musical tone generating apparatus which is independent and separate from an electronic musical instrument having a plurality of keys and generating key information signals, said musical tone generating apparatus receiving said key information signals and generating musical tone signals separate from tone signals generated by the electronic musical instrument in response to depression of keys of the electronic musical instrument, the improvement wherein the tone generating apparatus includes means for selectively restricting the operation thereof and selectively setting a key range thereof that includes a variable number of less than all of the keys of the electronic musical instrument to generate tones only in response to the depression of keys of the electronic musical instrument within the selected key range.

4,711,149

ELECTRIC GUITAR PICKUP SWITCHING SYSTEM

Harvey W. Starr, 21668 Wohelo Trail, Chatsworth, Calif. 91311

Filed Jul. 12, 1985, Ser. No. 754,402
Int. Cl.[4] G10H *3/18;* G09B *15/02*
U.S. Cl. 84—1.16 **11 Claims**

7. A switching assembly for an electric guitar having at least two pickups and an output circuit for substituting different electrical pickups of the electric guitar into the output circuit of the electrical guitar comprising:

a plurality of manually operated electrical switches, one for

each desired combination of pickups to be connected at any one time to the output circuit of the electric guitar;

electrical signal combining means connectable to each of said plurality of manually operated switches and the electrical pickups of said guitar and to said output circuit; and

indicator means controlled by said manually operated switches for indicating which of the electrical pickups of said guitar are connected to the output circuit of said guitar.

4,711,150

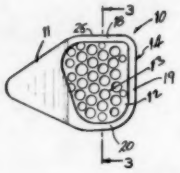
PICK FOR STRINGED INSTRUMENTS

Steven J. Hyduck, 17 Saltaire Dr., Saybrook, Conn. 06475

Filed Dec. 4, 1984, Ser. No. 677,989

Int. Cl.[4] G10D *3/16*

U.S. Cl. 84—322 **10 Claims**



1. A musicians' pick for a stringed instrument comprising a member consisting of a gripping portion and a picking portion, said picking portion being of generally triangular shape extending from said gripping portion and tapering to a picking end, said gripping portion having opposed surfaces and on one surface thereof having a generally rectangularly shaped depression for a thumb bounded by rims on three sides and the picking portion on the fourth side, one of said rims being substantially perpendicular to the length of a gripping thumb at the outer end of the gripping thumb, an oppositely disposed rim bounding said thumb depression inwardly of the outer end of a thumb from said one rim, said gripping portion on the opposite surface thereof having a generally linearly directed depression and having a nominal center line at a substantial transverse angle to the length of said thumb depression but less than ninety degrees.

4,711,151

MISSILE LAUNCHER

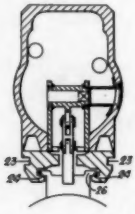
Dennis Griffin, Guildford, and Charles A. Field, Kingston-upon-Thames, both of England, assignors to Frazer-Nash Ltd., Surrey, England

Filed Jan. 23, 1986, Ser. No. 824,559

Claims priority, application United Kingdom, Oct. 30, 1984, 8427444

Int. Cl.[4] F41F *3/04*

U.S. Cl. 89—1.805 **10 Claims**



1. An airborne missile launcher of modular construction comprising:

(a) a main module, comprising an intermediate main body section having first and second oppositely disposed surfaces and first and second oppositely disposed ends said intermediate main body section usable with all the types of missile to be carried and of a length less than full body length, said main body being adapted for fixing to an aircraft along its first surface, said main body section having a first member of a first cooperating attachment element located proximate to said first end, a first member of a second cooperating attachment element located proximate to said second end and a first member of a third cooperating attachment element proximate to said second surface said main body further adapted to receive a nose section and a tail section to complete the body length;

(b) a forward module, comprising a nose section and a second member of the first attachment element which cooperates with the first member to connect the nose section to the main body section in a manner where the nose section is releasably affixed to the first end of the main body section;

(c) an aft module, comprising a tail section and a second member of the second attachment element which cooperates with the first member to connect the tail section to the main body section in a manner where the tail section is releasably affixed to the second end of the main body section;

(d) a sub-rail adapted to carry a missile and a second member of the third attachment element which cooperates with the first member to connect the sub-rail to the main body section in a manner where the sub-rail is releasably attached to said main body section;

(e) sub-rail locking means;

(f) retracting means for a missile umbilical connection;

(g) retraction means for missile striker points;

(h) retractable missile hook snubbers; and

(i) a nitrogen bottle with a nitrogen supply regulator carried right forward of said main body section.

4,711,152

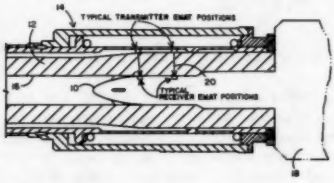
APPARATUS FOR TRANSMITTING DATA TO A PROJECTILE POSITIONED WITHIN A GUN TUBE

Chris M. Fortunko, Newport Beach, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Filed Oct. 30, 1986, Ser. No. 925,280

Int. Cl.[4] F42C *17/00*

U.S. Cl. 89—6.5 **20 Claims**



1. An apparatus for transmitting data to a projectile positioned within the bore of a gun tube; the apparatus comprising:

at least two ultrasonic transducers, a first such transducer positioned adjacent the inner surface of said gun tube within said bore, and a second such transducer positioned adjacent the outer surface of said gun tube;

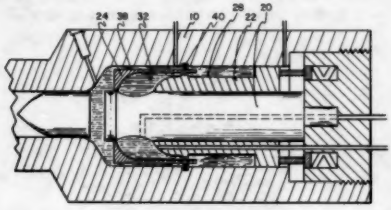
means for applying a data modulated radio frequency electromagnetic signal to said second transducer for transmitting a corresponding ultrasonic signal from said second transducer to said first transducer through said gun tube; and

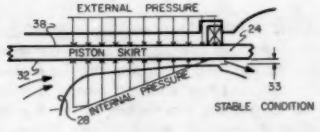
means connected to said first transducer for demodulating said corresponding ultrasonic signal for use of said data in said projectile.

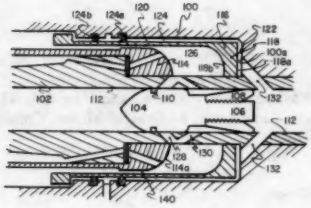
4,711,153
SEAL

Melvin J. Bulman, Colchester, Vt., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 15, 1986, Ser. No. 941,909
Int. Cl.[4] F41F *1/04*
U.S. Cl. 89—7 8 Claims







1. A sealing mechanism for a pump having:

a central journal;

a piston having a piston head and a skirt defining a central cavity, said skirt having its distal region disposed on said central journal with one end of said journal projecting into said cavity to define:

a pumping chamber between said projecting one end of said journal and said piston head, and

a clearance gap between said journal and said piston skirt distal region and in fluid communication with said pumping chamber,

characterized in that:

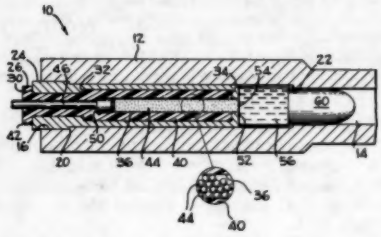
said skirt is so constructed and arranged as to be distorted centrifugally when the pressure within said gap is greater than the pressure external to said skirt and centripetally when the pressure within said gap is less than the pressure without said skirt, and

having a mode of operation such that during compression of fluid within said pumping chamber a fluid pressure is developed within said pumping chamber which is greater than the pressure outside said piston and a flow of fluid leaks from said pumping chamber into and through said clearance gap whereby as such flow of fluid passes along the length of said clearance gap it develops a progressively lower pressure, becoming lower than said pressure outside said piston, whereby the distal region of said skirt is distorted centripetally to tend to close said clearance gap to tend to halt such flow.

4,711,154
COMBUSTION AUGMENTED PLASMA PRESSURE AMPLIFIER

George Chryssomallis, Golden Valley, and Robert S. Griffing, Andover, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 31, 1985, Ser. No. 795,033
Int. Cl.[4] F41F *1/04*
U.S. Cl. 89—7 13 Claims



1. A propulsive charge for use in projecting a projectile comprising:

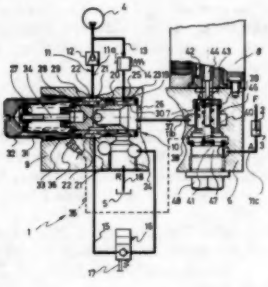
a cartridge having a plurality of chambers including a fuel chamber from which a plasma fuel may be generated and an oxidizer chamber; said fuel chamber containing a dielectric, a first conductive means surrounded by said dielectric and an inwardly extending projection electrically communicative with said cartridge formed to provide an oriface between said fuel chamber and said oxidizer chamber, said cartridge having an outer electrically conductive body;

said oxidizer chamber adjacent said fuel chamber and communicable therewith through said orifice, said oxidizer chamber containing an oxidizer material capable of reacting chemically with said plasma fuel exhausted from said fuel chamber when said fuel is delivered to said oxidizer chamber.

4,711,155
HYDRAULIC CONTROL DEVICE

Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Heilmeier & Weinlein Fabrik fur Oel-Hydraulic GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Oct. 7, 1986, Ser. No. 916,171
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536219
Int. Cl.[4] F15B *13/044*
U.S. Cl. 91—446 17 Claims



1. A hydraulic control device (1, 1', 1") for a hydraulic motor (2) working one-sidedly against a load (F), comprising a working pressure line (11) connecting a pressure source (4) via

line sections (11*a*, 11*b*) with a hydraulic motor (2) and containing a non-return valve (12) from which a bypass line (15, 15') to a tank (5) is branched off, a three-way flow controller with proportional magnetic actuation, which is connected to the tank with its control outlet, a two-way flow controller in the bypass line (15), the three-way flow controller being actuated upon non-actuated two-way flow controller for the working of the hydraulic motor against the load (F) and the two-way flow controller being actuated upon non-actuated three-way flow controller for the working of the hydraulic motor under the load for controlling the speed, and a measuring orifice (7), a pressure balance and a proportional magnet being in each case allocated to the three-way and the two-way flow controller, characterized in that a single measuring orifice (7) being common to both pressure balances (10; 53, 54) with a single proportional magnet (8) is provided in the working pressure line (11).

4,711,156

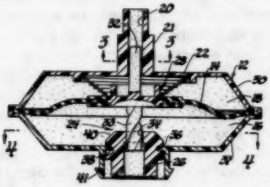
ACTUATOR FOR CONVERTING LINEAR MOTION TO ROTARY MOTION AND VICE VERSA

Fariborz Kayyod; Richard J. Stuart, and Jeffrey D. Ogden, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 741,467, Jun. 5, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 6,357

Int. Cl.[4] F01B *3/00*

U.S. Cl. 92—31 **1 Claim**



1. A linear to rotary actuator having a fluid pressure operated diaphragm whose linear movement is translated into rotary movement of an output member by a helical coupling therebetween characterized by such coupling comprising a coupling member joined to the diaphragm so as to extend therethrough and interlock therewith while preventing fluid from passing from one diaphragm side to the other, said coupling member having a helix extending from one side of the diaphragm slidably engaging in a slot in the output member so as to effect rotary movement thereof with linear non-rotational movement of said coupling member, and said coupling member further having a centrally located stem of non-circular cross-section extending from the other side of the diaphragm slidably engaging a stationary guide in an elongated aperture therethrough, said guide and aperture having sides that cooperate to guide linear movement while preventing rotational movement of said coupling member and, the sides of said guide and aperture also cooperating to form a discrete singular fluid passage from the exterior of the actuator to said other side of the diaphragm.

4,711,157

ACTUATOR FOR CONVERTING LINEAR MOTION TO ROTARY MOTION AND VICE VERSA

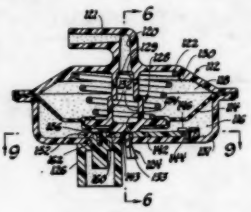
Fariborz Kayyod; Richard J. Stuart, and Jeffrey D. Ogden, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 741,467, Jun. 5, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 907,231

Int. Cl.[4] F01B *3/00*

U.S. Cl. 92—31 **2 Claims**

1. A linear to rotary actuator having a fluid pressure operated diaphragm whose linear movement is translated into rotary movement of an output member by a helical coupling therebetween characterized by such coupling comprising a coupling member joined to the diaphragm so as to extend therethrough, a first gear, said coupling member having a helix extending from one side of the diaphragm slidably engaging in a slot in said first gear so as to effect rotary movement thereof with linear non-rotational movement of said coupling member, a second gear meshing with said first gear and connected to said output member, said coupling member further having a centrally located integral stem of non-circular cross-section



extending from the other side of the diaphragm slidably engaging a stationary guide in an elongated aperture therein of corresponding but substantially larger non-circular cross-section so as to guide linear movement while preventing rotational movement of said coupling member whereby linear movement of the diaphragm forces linear non-rotational movement of said coupling member and thereby operation of said helix in said slot to turn said sector gear and thereby the other gear to effect rotary movement of the output member.

4,711,158

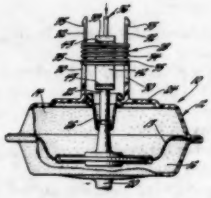
LINEAR MOTION ACTUATOR WITH SPRING CENTERING MEANS

Fariborz Kayyod, Anderson, Ind., and Donald E. Hoffman, W. Seneca, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1985, Ser. No. 807,595

Int. Cl.[4] F01B *19/00*; F16J *3/00*

U.S. Cl. 92—94 **3 Claims**



1. An actuator having a casing with an interior divided into two chambers by a diaphragm, an output member connected to the diaphragm and extending out through one side of the casing, and the diaphragm being operable in response to pressures in the chambers to move the output member linearly in both an extending direction and a retracting direction, characterized by a centering mechanism comprising a pair of spring seats fixed to the one side of the casing and spaced apart longitudinally of the output member, a pair of spring seats fixed to the output member and spaced apart the same distance as those on the casing so as to be angularly arranged between and radially aligned with the respective seats on the casing, a compression spring arranged between and normally simultaneously seating at opposite ends thereof on the pairs of seats on both the casing and the output member, and the seats on the casing and output member located relative to the extent of output member travel so that the spring operating through all of the seats normally locates and yieldingly holds the output member

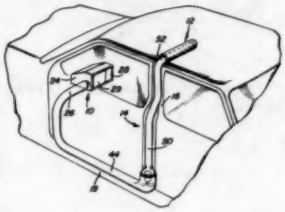
in mid-position and is compressed between one of the seats on the casing and one of the seats on the output member on pressure induced movement of the output member in both the extending and retracting direction and then on discontinuance of the pressure induced movement operates to return the output member to the mid-position.

4,711,159

BUILT-IN VEHICLE AIR FILTRATION SYSTEM

Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064

Filed Sep. 23, 1986, Ser. No. 910,636
Int. Cl.[4] B60H *3/06*
U.S. Cl. 98—2.11 **14 Claims**



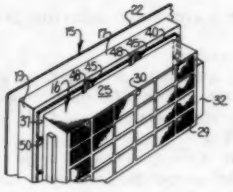
1. An air filtration and purification system for the interior of a vehicle comprising an air intake adjacent the center portion of the headliner of a vehicle, an air duct extending downwardly within the side pillar of the vehicle and forwardly within the rocker panel of the vehicle, a housing located under the dashboard of the vehicle with the duct connected thereto, said housing including a foam plastic filter and carbon filter through which air passes, a heat exchange coil inwardly of the filters through which air passes, fan means circulating air through the housing, and discharge means from the housing for discharging air into the interior of the vehicle after the air has been cleaned and purified by passing through the filters and conditioned by passing through the heat exchange coil.

4,711,160

TWO-PIECE FOUNDATION VENTILATOR

Alvin E. Witten, and Erik H. Witten, both of Gastonia, N.C., assignors to Witten Automatic Vent Company, Inc., Gastonia, N.C.

Filed May 11, 1987, Ser. No. 48,258
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—29 **16 Claims**



1. In a molded plastic two-piece foundation ventilator including a rectangular mounting cover frame of predetermined width and height and adapted to be mounted in a rectangular opening in a foundation wall, a peripheral flange integrally molded with the outside of said mounting cover frame and adapted to extend around and cover the opening in the foundation wall, and a rectangular shutter support housing of predetermined width and height of lesser dimensions than said predetermined width and height dimensions of said mounting cover frame, the combination therewith of means for removably maintaining said shutter support housing and said mounting cover frame in assembled condition and comprising

(a) integrally molded flanges extending outwardly from opposite sides of said shutter support housing, and

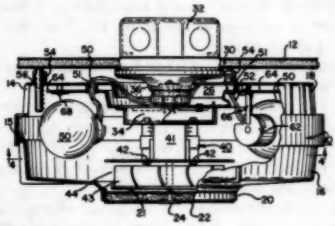
(b) upstanding clip members integrally molded along opposite sides of said mounting cover frame, said clip members including inwardly extending locking portions being positioned in overlying engagement with said integrally molded flanges of said shutter support housing to maintain said shutter support housing and said mounting cover frame in assembled condition and to permit said shutter support housing to be removed from said mounting cover frame by sliding said shutter support housing longitudinally along said mounting cover frame until said flanges move out of engagement with said inwardly extending locking portions of said clip members.

4,711,161

DUCTLESS AIR TREATING DEVICE WITH ILLUMINATOR

Richard E. Swin, Sr., Burr Ridge, and Anwar A. Atalla, Willowbrook, both of Ill., assignors to Tec-Air, Inc., Willow Springs, Ill.

Continuation of Ser. No. 57,592, Jul. 16, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,683
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—31.5 **13 Claims**



1. A ductless unitized air treating and illuminating module to be electrically coupled to and suspended from a ceiling electrical socket having an internally threaded electrical contact comprising

a housing having an air inlet and an air outlet with a path of air flow defined therebetween,

an externally threaded electrical contact fixedly secured on an outer portion of said housing and directly engagable into a ceiling mounted electrical socket having an internally threaded electrical contact for coupling a source of electrical power to within said housing,

said externally threaded electrical contact fixedly secured on the outer portion of said housing to directly engage the internally threaded contact comprising an electrical contact for coupling a source of electrical power to within said housing and a support for physically connecting said housing directly to the internally threaded electrical socket when threadingly engaged therewith,

air circulating means carried by said housing for drawing air thereinto through said air inlet and discharging the air drawn thereinto out through said air outlet,

said air circulating means being electrically coupled to said externally threaded electrical contact fixedly secured on an outer portion of said housing, and

illuminating means carried by said housing and actuable to emit light therefrom,

said illuminating means being electrically coupled to said externally threaded electrical contact and positioned in thermal contact with said path of air flow to dissipate heat generated upon the actuation thereof.

4,711,162

METHOD OF VENTILATING ROOMS

Mats Eriksson, Ski, Norway, assignor to Flakt, AB, Stockholm, Sweden

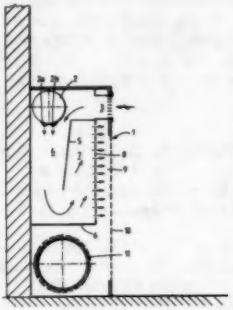
PCT No. PCT/NO85/00069, § 371 Date Jun. 11, 1986, § 102(e) Date Jun. 11, 1986, PCT Pub. No. WO86/02710, PCT Pub. Date May 9, 1986

PCT Filed Oct. 28, 1985, Ser. No. 878,375

Claims priority, application Norway, Oct. 30, 1984, 844320

Int. Cl.[4] F24F *13/04*

U.S. Cl. 98—38.3 **7 Claims**



3. A method of ventilating a room having a floor and a ceiling located a preset height above the floor, the method comprising the steps of:

conducting at least a first jet of fresh air at a high velocity into an induction chamber;

drawing air into the induction chamber from the room at an input level, said input level being above the floor and no higher above the floor than ⅓ if the preset height;

mixing the fresh air and the room air in the induction chamber to produce a supply of mixed air;

conducting the mixed air from the induction chamber essentially horizontally into the room, by means of a diffuse air supply, said mixed air being conducted into the room at a level below the input level and at or near the level of the floor; and

exhausting air from the room at or near the level of the ceiling.

4,711,163

ACETIC ACID FERMENTATION PROCESS AND APPARATUS

Giuseppe Capuano, Via Milliscola 131, Arco Felice (Pozzvoli), Italy

Filed Jun. 4, 1986, Ser. No. 870,475

Int. Cl.[4] A23L *1/18*

U.S. Cl. 99—323.12 **16 Claims**

1. An acetic acid fermentation apparatus comprising:

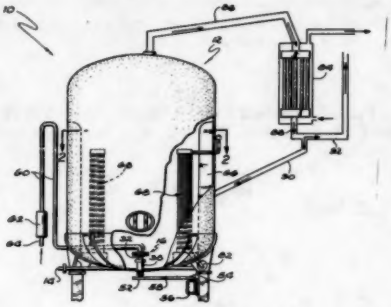
a substantially enclosed receptacle which can be partially filled with wine.

port means through which said wine charged to and/or discharged from said receptacle;

temperature regulating means interiorly positioned said receptacle for maintaining said wine below a desired temperature during the fermentation of said wine;

aerating means for impregnating and dispersing an oxygen-bearing gas into said wine at a predefined gas flow rate and in a multidirectional circulation flow sufficient enough to substantially saturate said wine with said gas; and

condensing means for returning to said wine in said receptacle substantially all of any vaporized and/or entrained



ethanol and acetic acid carried by any exhaust gas coming off of said wine.

4,711,164

OVEN FOR PREPARING FRIED FOOD PRODUCTS

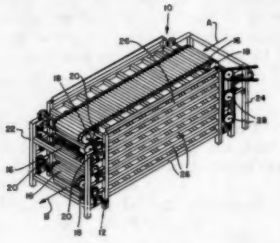
Fausto C. Mendoza, Calzada San Esteban Num 57, Naucalpan de Juarez, Mexico

Filed Feb. 27, 1986, Ser. No. 834,400

Claims priority, application Mexico, Apr. 19, 1985, 205.029

Int. Cl.[4] A21B *1/42*

U.S. Cl. 99—339 **5 Claims**



1. An improved oven for preparing fried products, comprising:

(a) a frame structure;

(b) a plurality of sets of burners disposed at different levels of said structure, said sets of burners being operable to produce different temperatures at said different levels of said structure; and

(c) a plurality of transport belts mounted across said structure and being operable to traverse said structure and carry product along a serpentine path through said sets of burners at said different levels, each of said belts having an upper run and a lower run, said lower and upper runs of some of said belts being disposed closely adjacent respective upper and lower runs of others of said belts and having laterally spaced apart raised separator elements thereon which form elongated hollow chambers between said adjacent runs of separate belts and adjacent given ones of said sets of burners at respective ones of said levels of said structure which chambers by themselves constitute mini-ovens at said respective levels.

4,711,165

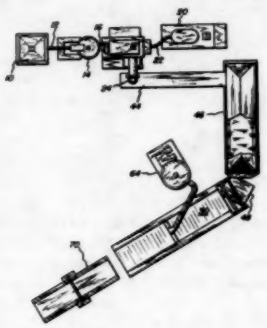
LASAGNA PRODUCT

Leno Codino, 8 Rivercrest Dr., Rexford, N.Y. 12148

Continuation of Ser. No. 788,083, Oct. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 683,356, Dec. 19, 1984, Pat. No. 4,569,849. This application May 13, 1987, Ser. No. 51,250

Int. Cl.[4] A23L *1/16*; A23P *1/00*

U.S. Cl. 99—353 **10 Claims**



1. A machine for the production of precooked lasagna comprising:

means for mixing flour and eggs to a predetermined consistency;

an extruder for receiving said flour and egg mixture and extruding at least two continuous strips of broad lasagna type noodles;

means for transporting the strips being extruded through a cooker;

a cooling tank in close proximity to the cooker for reception of the noodles as they exit from the cooker, said tank being of sufficient size to contain a predetermined amount of noodles so as to provide slack and prevent breaking of the noodle strips;

means for suspending the noodle strips above the tank as said strips are drawn from the tank thereby allowing said strips to unwind;

means for aligning one of the strips on top of the other;

means for filling the space between the noodle strips with a previously chose filler; and

means for cutting the now precooked lasagna into pieces of predetermined size.

4,711,166

AUTOMATIC MACHINE FOR MAKING STONE FRUIT BISCUIT

Tsai A. Chen, 201 Sec. 3, Ba-Dar Road, Taipei, Taiwan

Filed Mar. 5, 1987, Ser. No. 22,367

Int. Cl.[4] A47J *37/00*

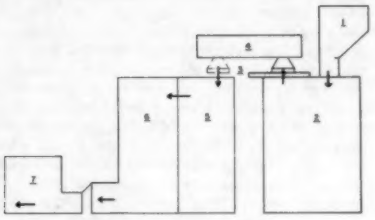
U.S. Cl. 99—353 **5 Claims**

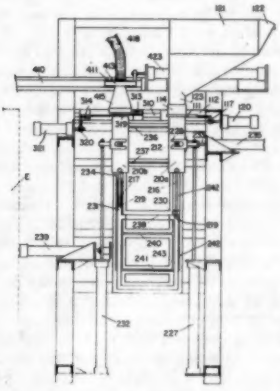
1. An automatic machine for making stone fruit biscuit comprising

a material reserving means which comprises a material reserving chamber, a supporting plate secured onto the walls of said material reserving chamber, a plurality of perforations bored on said supporting plate, a plurality of tubes in a row each brazed with one end onto said perforation, a plurality of blade guiding grooves on the bottom side of said supporting plate, said blade guiding grooves extending past said perforations, a plurality of blades extending into said guiding grooves, an actuating plate **117** on which said blades are mounted, at least an air cylinder to drive said actuating plate, a hopper secured onto the walls of said material reserving chamber above said tubes, said hopper being provided with a plurality of stone fruit conduits in a row inserted within said tubes;

a material restoring means which comprises a material restoring chamber next to said material reserving chamber, two opposite track frames securedly mounted on the walls of said material restoring chamber, two material conveying tube rows mounted between said two opposite track frames, two transverse air cylinders and two perpendicular air cylinders mounted on the walls of said material restoring chamber to alternatively drive said material conveying tube rows perpendicularly and horizontally,

a planing means above said track frames, said planing means comprising a planing chamber, two track plates opposite to each other, said two track plates being secured onto the walls of said planing chamber, an upper blade seat both ends of which are respectively secured onto the upper portions of said two track plates, a lower blade seat both ends of which are respectively secured onto the lower





portions of said two track frames, an upper blade secured onto the bottom of said upper blade seat, a cutting blade secured onto the surface of said lower blade seat, a driving plate secured onto the bottom of said lower blade seat and an air cylinder connected with said driving plate;

a suction means above said planing means, said suction means comprising a suction chamber, two horizontal track bars secured on the walls of said suction chamber, a sliding board secured with at least two rollers at each end thereof, said rollers being movably received within the tracks of said track bars, a bore approximately at the middle portion of the sliding board, a tube connector secured onto the surface of said sliding board above said bore, a suction tube sleeved onto said tube connector, a trapezoidal suction frame secured onto the bottom of said sliding board beneath said bore, a suction plate secured onto the lower portion of said traperoidal suction frame, said suction plate being bored a plurality of perforations thereon, a dust collector connected to one end of said

suction tube, and an air cylinder on one side of said sliding board;

a moulding means under said suction means, said moulding means comprising a moulding chamber, a driving shaft driven by a motor, said driving shaft being movably supported on the walls of said moulding chamber, a pair of chain wheels securedly mounted on both ends of said driving shaft, an upper driven shaft movably mounted on the walls of said moulding chamber, a pair of upper chain wheels securedly mounted on both ends of said driven shaft, a base dough barrel mounted on the upper wall of said moulding chamber, a surface dough barrel mounted on the upper wall of said moulding chamber, said base dough barrel and surface dough barrel being adjacent to each other, two chains running across said lower and upper chain wheels and a plurality of moulding plates each suspended between said chains;

a baking means horizontally next to said moulding means, said baking means comprising a baking chamber next to said moulding chamber, an upper gap provided at the upper portion of the perpendicular wall which separate said moulding chamber and said baking chamber whereby said moulding plates may enter therethrough, a reversing chamber next to said baking chamber, a lower gap provided at the wall between said baking chamber and said reversing chamber whereby said moulding plates may pass through, a plurality of heating coil frames horizontally mounted on the walls of said baking chamber, a plurality of heating coils on said heating coil frames, said heating coils being connected with a power supply, a plurality of pairs of chain wheels mounted on the walls of said baking chamber, each pair being at each turning position of said chains which runs from said chain wheels in said moulding chamber, a plurality of releasing heads in a row driven by a motor, said releasing heads extending into said reversing chamber, a pair of chain wheels mounted at the upper left end of said reversing chamber for said chains to run from said baking chamber into said reversing chamber and back to said chain wheels in said moulding chamber, a releasing plate mounted between the upper left end of said reversing chamber, a slide extending into said opening, said slide having a curved plate at the upper end thereof, and a cleaning and oil coating apparatus mounted on the base of said reversing chamber; and

a cooling means next to said reversing chamber, said cooling means comprising a cooling chamber, a plurality of chain wheels mounted on the walls of said cooling chamber, a transmission shaft on both ends of which a pair of chains are respectively mounted, said transmission shaft being driven by said motor which drives said driving shaft in said moulding chamber, a plurality of shaping plates suspended between said pair of chains, a plurality of cooling air tubes extending into said cooling chamber, a checking plate mounted on the walls of said cooling chamber at the lower portion thereof, an outlet opened on one wall of said cooling chamber at the rear end of said checking plate, a conveyor immediately outside of said outlet.

4,711,167

FRUIT JUICE SQUEEZER

Takashi Sano, Tokyo, Japan, assignor to Pigeon Corp., Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,689

Claims priority, application Japan, Sep. 10, 1984, 59-136246[U]; Sep. 10, 1984, 59-188061

Int. Cl.[4] A23N *1/00*

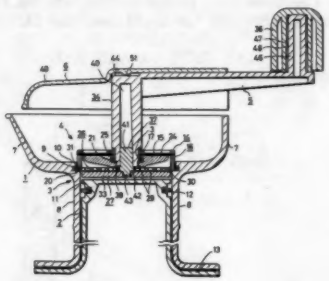
U.S. Cl. 99—510 **5 Claims**

1. A fruit juice squeezer for obtaining fruit juice from fruit by pressing and cutting, comprising:

a squeezer body having a reservoir means for storing said fruit juice;

a handle rotatable with respect to said body;

mincer means being operable by the turning of said handle and filter means being fixed to said squeezer body, wherein said mincer means comprises a cutter means connected to said handle for rotational movement coaxial with said filter means; and



a fruit loading means axially movably disposed adjacent said cutter means for accommodating said fruit to be squeezed, and wherein said fruit loading means moves towards said cutter means when said squeezer is in operation.

4,711,168

SEALING ARRANGEMENT FOR A DOUBLE BAND PRESS

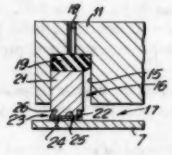
Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,935

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445636

Int. Cl.[4] B30B *5/06*

U.S. Cl. 100—154 **11 Claims**



1. Double band press for pressing a continuously running sheet material comprising a rigid press frame, bearing supports mounted on said press frame, reversing drums mounted in said bearing supports and arranged as at least one pair of spaced upper drums and at least one pair of spaced lower drums, an upper endless press belt entrained around said upper drums and a lower endless press belt entrained around said lower drums, each said press belt having an outer surface and an inner surface with said outer surfaces disposed in facing relationship forming a reaction zone therebetween through which the sheet material passes a pressure plate located within each said press belt and extending in the direction between said reversing drums, said pressure plates spaced closely from the inside surfaces of said press belts adjacent to said reaction zone, said pressure plates each having a surface facing the associated inner surface of said press belt and said surface being bordered by an edge, a groove formed in said surface of said pressure plate and spaced inwardly from said bordering edge, a sliding seal located within said groove and extending out of said groove into contact with said inner surface of the associated said press belt, means within said groove for pressing said seal against the inner surface of said press belt, the combination of the surface of said pressure plate facing the inner surface of the associated said press belt and said sliding seal forming a pressure chamber, fluid pressure means within said pressure cham-

ber for pressing said press belt toward said reaction zone, wherein the improvement comprises that said sliding seal comprises a body formed of metal located within said groove and being displaceable within said groove toward the inner surface of the associated press belt, said sliding seal having a first surface facing the inner surface of said press belt, a dry metal layer forming the first surface of said sliding seal and arranged to engage the inner surface of said press belt in sliding contact, said dry metal layer is supported on said body and is formed of a different metal than said body.

4,711,169

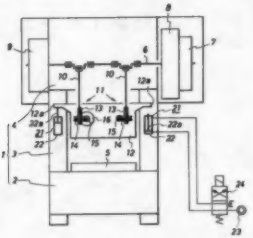
BALANCING DEVICE FOR PRESS

Shozo Imanishi, and Mitsuo Sato, both of Sagamihara, Japan, assignors to Aida Engineering Co., Ltd., Kanagawa, Japan

Filed Nov. 25, 1985, Ser. No. 802,340

Int. Cl.[4] B30B *5/00*

U.S. Cl. 100—257 **5 Claims**



1. A balancing device for a press of the type in which a slide moves up and down with respect to a bolster during operation of the press and in which the position of the slide at the end of its downward movement with respect to the bolster is adjustable relative to the bolster to adjust a die height clearance of the press, said balancing device comprising an upward urging means mounted on said press and engagable with the slide, said upward urging means engaging the slide for urging the slide upwardly when the die height clearance is adjusted, said upward urging means being disengaged from the slide when the slide moves up and down with respect to the bolster during operation of the press.

4,711,170

PRINTING WIRE DRIVING DEVICE IN WIRE DOT PRINTER

Morio Yamaguchi, Tokyo, Japan, assignor to Max Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1985, Ser. No. 813,934

Claims priority, application Japan, Dec. 27, 1984, 59-200760[U]; Nov. 29, 1985, 60-182910[U]

Int. Cl.[4] B41J *3/12*

U.S. Cl. 101—93.05 **17 Claims**

1. A printing wire driving device in a wire dot printer for printing on a surface, comprising:

a printing wire, one end of which is adapted to be operatively engaged and hammered for printing;

a wire driving means for operatively engaging and hammering the one end of said printing wire;

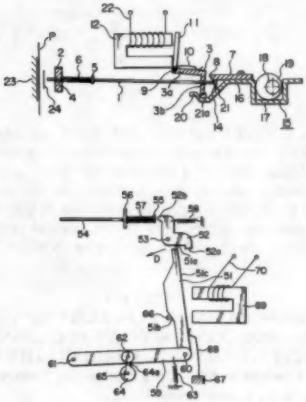
an eccentric cam for driving said wire driving means from an original position spaced from said surface toward operative engagement with the printing wire;

a first elastic member for returning said printing wire to an original position after said wire has been hammered by said wire driving means;

a printing wire support member for slidably supporting said printing wire;

a second elastic member for urging said printing wire support member so as to urge at least one of said wire driving means and said printing wire into a displaced orientation when said wire driving means is driven in a direction for hammering said printing wire so that said one end of said printing wire and said wire driving means cannot be operatively engaged;

guide means operatively coupled to said wire driving means for aligning said wire driving means and said one end of said printing wire against the force of said second elastic member in synchrony with an operation of said wire driving means by supporting said printing wire support member when said wire driving means is returned to the original position thereof;



maintaining means for maintaining a position of said printing wire support member so as to operatively maintain said wire driving means and said one end of said printing wire in operative alignment with each other, against the force of said second elastic member, in response to a printing command; and

whereby, the portion of said printing wire supported by said printing wire support member is moved toward the maintaining position provided by said maintaining means due to the action of said guide means when said wire driving means is returned to the original position thereof and power is supplied to said maintaining means according to the printing command.

4,711,171

SYSTEM FOR LATERAL TRANSPORT OF LIQUID ALONG A PRINTING MACHINE ROLLER

Klaus Theilacker, Friedberg, Fed. Rep. of Germany, assignor to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,736

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3540912

Int. Cl.[4] B41L *23/00, 25/00*

U.S. Cl. 101—148 **9 Claims**

1. In a printing machine having

a liquid roller (1) with a surface adapted to be coated with a liquid,

an arrangement to transport excess liquid axially along the liquid roller,

comprising, in accordance with the invention,

a transport roller (2) in engagement with the surface of the liquid roller (1),

said transport roller having a surface formed by two conical portion (4, 5) positioned with the smaller diameters of the conical portions being located adjacent axial end portions of the transport roller;

means (16, 17) for axially oscillating or reciprocating the transport roller (2) with respect to the liquid roller (1); and means for alternately engaging the respective conical portions of the transport roller with the liquid roller (1) in synchronism with the oscillating or reciprocating movement of the transport roller, by engaging that one (see

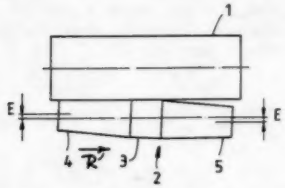


FIG. 1: 4) of the conical portions of the transport roller with the liquid roller (1) which is moving with respect to the liquid roller in a direction (R) towards the center of the liquid roller to move liquid on the liquid roller from the end or edge regions thereof towards the center region by alternate engagement of the conical portions of the transport roller with the surface of the liquid roller.

4,711,172

MACHINE HAVING A PLURALITY OF WORKING STATIONS FOR SUCCESSIVELY PROCESSING A SHEET OF MATERIAL RUNNING THROUGH THE MACHINE

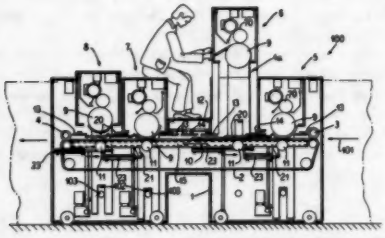
Bernard Capdeboscq, Saint Just Chaleyssin, France, assignor to Martin S.A., Villeurbanne, France

Filed Jul. 25, 1986, Ser. No. 890,836

Claims priority, application France, Jul. 26, 1985, 85 11655

Int. Cl.[4] B41F 9/02

U.S. Cl. 101—152 **10 Claims**



1. In a machine for successively processing cardboard sheets running through a machine having a plurality of printing stations, said machine including a main frame having main conveyor means extending from an inlet to an outlet including a suction belt, a pressure cylinder acting on the belt at the inlet and a pressure cylinder acting on the belt at the outlet, a plurality of printing stations being mounted along the suction belt of the conveyor means with each printing station having one printing cylinder mounted in an active part of the station and a counter cylinder mounted in the frame below the suction belt to cooperate with the printing cylinder, the improvements comprising the printing stations being arranged in pairs with a transverse foot bridge extending between two pairs of printing stations, the active parts including the printing cylinder of each printing station being mounted on slides for movement in a vertical direction on the frame, lifting means for each station for moving the slides in a vertical direction to shift the printing cylinder between a working position for engaging a sheet carried by said suction belt through a standby position with the cylinder out of engagement with a sheet on said belt to a preparative position enabling a worker standing on the foot bridge to gain access to the active parts of the printing station, the counter cylinders of each station being fixed in a permanent and unchanged vertical position during movement of the printing cylinder in the vertical direction, and means for insuring the guiding of the upper surface of a sheet through the printing station while said printing station is in one of the standby and preparative positions.

4,711,173

CHANGING DRIVE FOR THE DISTRIBUTING ROLLERS OF AT LEAST ONE INKING UNIT OF A PRINTING UNIT OF AN OFFSET ROTARY PRESS

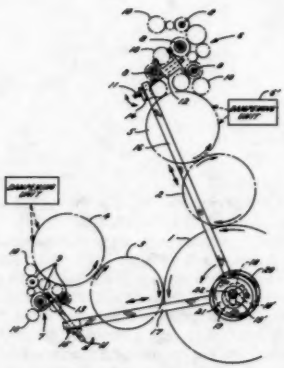
Helmut Emrich, Offenbach am Main; Josef Mathes, Offenbach; Heinrich Ochs, Sinntal-Oberzell, and Janko Despot, Offenbach am Main, all of Fed. Rep. of Germany, assignors to M.A.N.- Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1986, Ser. No. 823,345

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502863

Int. Cl.[4] B41F 31/14

U.S. Cl. 101—349 **5 Claims**



1. In a rotary printing press including an impression cylinder having an end portion, two plate cylinders associated with the impression cylinder, and respective inking units associated with the plate cylinders, each inking unit having a respective set of ink distributing rollers, a mechanism for axially reciprocating said ink distributing rollers, said impression cylinder having twice the diameter of the associated plate cylinders, so that the axial reciprocation of the sets of ink distributing rollers is derived in synchronism with the rotation of the impression cylinder and in a ratio of 1:2 to the rotation of the associated plate cylinders, said reciprocating mechanism generating reciprocating motions transmitted by coupling elements to the ink distributing rollers, wherein the improvement comprises,

first and second rotating eccentric drives for axially reciprocating the respective sets of ink distributing rollers, each of said rotating eccentric drives being adjustable in the amount of travel and the phase of the reciprocation and being connected to the end portion of the impression cylinder, said first rotating eccentric drive including a first drive disk fastened concentrically on the end portion of the impression cylinder and adjustable in the circumferential direction and a first eccentric disk fastened to said first drive disk and adjustable in the radial direction, said first eccentric disk having mounted thereon a first swing bearing that carries a first oscillating lever for a first one of said inking units, and said second rotating eccentric drive including a second drive disk fastened concentrically on the end portion of the impression cylinder and adjustable in the circumferential direction and a second swing bearing that carries a second oscillating lever fastened to said

second drive disk and adjustable in the radial direction for a second one of said inking units.

4,711,174

DEVICE FOR ENGAGING AND DISENGAGING THE FORM ROLLERS IN AN INKING UNIT OF A PRINTING MACHINE

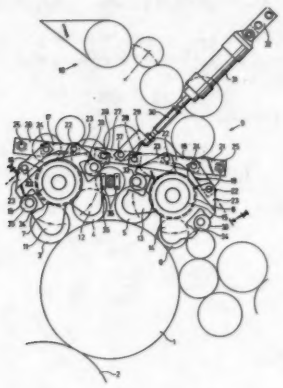
Hermann Beisel, Walldorf, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,234

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434645

Int. Cl.⁴ B41F *31/00, 31/14*

U.S. Cl. 101—352 **3 Claims**



1. Device for alternatingly engaging form rollers in an inking unit of a printing machine with a plate cylinder of the printing machine and for disengaging the form rollers therefrom, including bearing levers for the form rollers disposed at both side frames of the printing machine, an adjustable stop element engageable with each of said bearing levers the form rollers being pivotable on bearings of mutually adjacent distributor rollers and being engageable with and disengageable from the plate cylinder by an adjustment element, a pair of control levers at each side frame spaced from one another and pivotally mounted on respective stud bolts at the side frames of the machine; the two bearing levers at each side frame, being articulatingly connected via respective straps to each of said control levers, a compensating web, respectively, coupling said pair of control levers at each of the side frames; and a respective control cylinder supported on one of the side frames and engaging said compensating web for moving said control levers to force the respective form rollers alternatingly into engagement with the plate cylinder.

4,711,175

INK DISPENSING MEANS FOR PRINTING PRESSES

Peter Hummel, Offenbach am Main, and Joachim Steuer, Offenbach, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

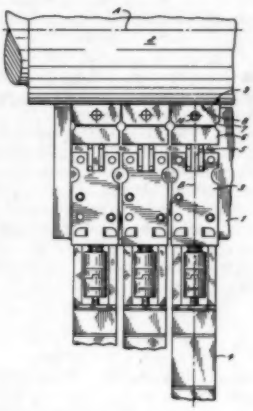
Filed Feb. 4, 1986, Ser. No. 826,143

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3503736

Int. Cl.⁴ B41F *31/04*

U.S. Cl. 101—365 **13 Claims**

1. An inking unit disposed in the ink duct of a printing press for regulating the quantity of ink dispensed on a duct roller of the press comprising in combination, a plurality of zone dispesnsing elements, each having a longitudinal axis and each dispensing element being adjustably mounted for movement along said longitudinal axis substantially radially relative to the duct roller, a blade disposed on each of said zone dispensing elements and each blade defining a dispensing edge cooperating with the duct roller to define a dispensing gap, each of said blades having a mounting surface and being adjustably mounted on said zone dispensing element for movement in a plane determined by the direction of dispensing element movement along said longitudinal axis and by the duct roller genera-



trix contacted by the dispensing edge, means for defining a fulcrum for said blade disposed perpendicular to said mounting surface of said blade and said longitudinal axis of said zone dispensing element, and means for releasably retaining said blade on said dispensing element for limited swinging movement of said blade about said fulcrum relative to said longitudinal axis so as to maintain said dispensing gap substantially uniform.

4,711,176

INK FOUNTAIN INCORPORATING INDIVIDUALLY REGULATED METERING SEGMENTS

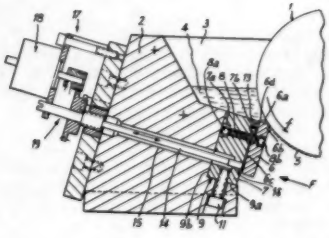
Armelin Michel, London, United Kingdom, assignor to Machines Chambon, Orleans, France

Filed Mar. 20, 1986, Ser. No. 841,857

Claims priority, application France, Mar. 22, 1985, 85 04283

Int. Cl.⁴ B41F *31/02*

U.S. Cl. 101—365 **5 Claims**



1. An ink fountain incorporating individually adjusted metering segments, for a printing machine, comprising a vat containing ink defined on one side by a horizontal inking roller driven in rotation and, on the other side, by a body extending parallel to the inking roller, and laterally by two vertical cheeks, the body of the ink fountain bearing, in the vicinity of the peripheral surface of the inking roller, a series of metering segments aligned parallel to the inking roller and each having

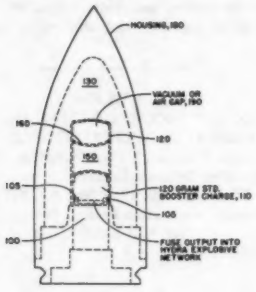
a front face close to the inking roller, said front faces each having a wiping edge parallel to the inking roller and which determines with the peripheral surface of the inking roller, a gap, means to adjust the width of the gap to determine the thickness of the film of ink formed on the inking roller downstream of each metering segment, springs acting on said metering segments adjusting pusher member mounted to slide in the body of the ink fountain and acting against said spring on the individual metering segments, and means associated respectively with the various pusher members for displacing the latter as a function of the desired thickness of the film of ink, all the metering segments being mounted to pivot about a common axis parallel to the inking roller, each metering segment forming a lever of the first type comprising a short first lever arm, between the wiping edge of the metering segment and the pivot axis thereof, and a longer second lever arm between the point of application of the effort of the pusher member on the metering segment and the pivot axis, each of said metering segments having a horizontal groove, and a horizontal groove in said body of the ink fountain aligned with the grooves in said metering segments, the common pivot axis of the metering segments being constituted by a rod maintained clamped between said aligned horizontal grooves of the various adjacent metering segments and said horizontal groove in the body of the ink fountain.

4,711,177

AUXILIARY BOOSTER

Joseph C. Foster, Jr., Ft. Walton Beach, and Andrew G. Bilek, Valparaiso, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 6, 1986, Ser. No. 893,846
Int. Cl.[4] F42C *19/08*
U.S. Cl. 102—204 **6 Claims**



1. A detonation system, comprising:

a housing having a fuse well which has a front end and back end, and in which said front end of said fuse well is constructed of materials selected from a group containing cerium aluminum alloys and zirconium;

a main charge which is housed in said housing adjacent to said fuse well;

a booster charge which is housed in the back end of said fuse well, said booster charge being capable of detonation when ignited to produce a detonation wave;

a means for igniting said booster charge;

an auxiliary booster charge which is housed in said fuse well adjacent to said booster charge, said auxiliary booster charge being sequentially detonated by the detonation of said booster charge to ignite said main charge and initiate its detonation; and

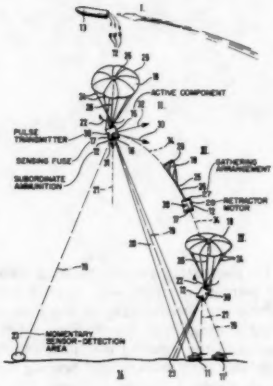
a flyer plate which is fixed in said fuse well between its front end and said auxiliary booster charge, said flyer plate being accelerated by the detonation of said auxiliary booster charge so that it strikes said front end with a high velocity and generates thereby vaporific effects which entail jets of very hot metal particles that enhance the detonation of the main charge, and wherein said flyer plate comprises a tapered metal liner which is fixed in said fuse well to said booster charge, said tapered metal liner being constructed of materials selected from a group containing cerium aluminum alloys and zirconium, said group having known pyrophoric characteristics which enhance the detonation of said main charge.

4,711,178

AMMUNITION INCORPORATING SEARCHING FUSE WITH TRAJECTORY CORRECTABLE DURING ITS FINAL FLIGHT PHASE AND METHOD FOR COMBATING ARMORED TARGET OBJECTS

Nikolaus Argyrakis, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 855,078
Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516673
Int. Cl.[4] F42B *25/24*
U.S. Cl. 102—384 **5 Claims**



1. In an article of ammunition including a sensing fuse, and a parachute, wherein the trajectory of the article is correctable during the final phase of flight thereof, the improvement comprising: said ammunition having a pulse transmitter for producing an offsetting directional component in a direction towards the sideways offset position of a target object which is detected by the sensing fuse; means for suspending the action of the parachute during approach of the ammunition towards a target along a quasi-ballistic trajectory; and a sensor-guidable gathering arrangemnt operatively connected to said parachute for respectively suspending and reinstating the action of said parachute.

4,711,179

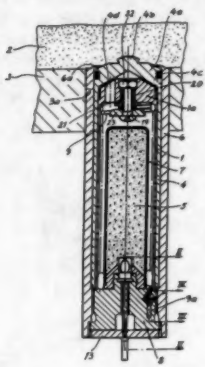
ARRANGEMENT IN A MINE WHICH IS CAPABLE OF BEING NEUTRALIZED

Sten Sundberg; Stig Risberg, both of Eskilstuna, and Ulf Eriksson, Ödeshög, all of Sweden, assignors to Affärsverket FFV, Eskilstuna, Sweden

PCT No. PCT/SE85/00489, § 371 Date Oct. 17, 1986, § 102(e) Date Oct. 17, 1986, PCT Pub. No. WO86/03827, PCT Pub. Date Jul. 3, 1986
PCT Filed Nov. 27, 1985, Ser. No. 916,970
Int. Cl.[4] F42B *23/24*
U.S. Cl. 102—426 **4 Claims**

1. An arrangement in a mine which is capable of being neutralized and which is intended for burial in the ground, including detecting means (33) operative to detect a neutraliza-

tion of the mine, initiator means (30) adapted to initiate detonation of a spotter charge (5) incorporated in the mine in response to the detection of a neutralization, and a spotter (1) which is arranged to be driven by the detonated charge from the mine to the surface of the overlying ground, in order to disclose the location of the mine, characterized in that a penetrator (4), which is intended to drive a pathway through the



ground to facilitate passage of the spotter (1), is arranged forwardly of the spotter as seen in its direction of travel, said spotter being capable of driving the penetrator in said direction during a first phase of the spotter firing sequence; and in that the arrangement further includes a separating device (9) which is intended to separate the spotter from the penetrator during a second phase of the firing sequence.

4,711,180

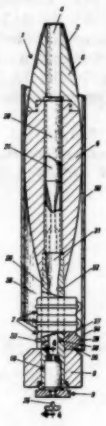
MORTAR TRAINING DEVICE WITH FUNCTIONAL SIMULATED PROPELLING CHARGES

John Smolnik, 81 Leamoor Dr., Parsippany, N.J. 07054

Filed Oct. 6, 1986, Ser. No. 915,566

Int. Cl.[4] F42B *13/22*

U.S. Cl. 102—445 **6 Claims**



1. A mortar training device similar to a service mortar cartridge for use in a standard mortar comprising, in combination;

a reusable sabot projectile of nominal mortar bore diameter including a body having a small caliber bore, a hollow boom joined axially to said body, a fin section joined axially to said boom;

a subprojectile accommodated within said small caliber bore of said sabot projectile body;

a propelling gas means for propelling said subprojectile including a propellant charge, said propelling gas means contained in said sabot projectile;

a charge initiating means including a percussion primer located aft of said propelling gas means;

a subchamber comprised of free volume within said sabot projectile aft of said subprojectile wherein subchamber gases are received from said propellant charge to propel said subprojectile;

a mortar chamber comprised of free volume within said mortar adjacent said sabot projectile;

a propelling gas egress means including a plurality of gas control ports connecting said subchamber and said mortar chamber for reducing subchamber gas pressure;

a plugging means including manually and individually removable plugs to block said gas control ports;

a plug retaining means to prevent said plugs from being dislodged by said subchamber gas pressure;

a sabot projectile expelling means including said propelling gas means, and a supplemental gas port means for discharging gases into said mortar chamber to eject said sabot projectile, said sabot projectile expelling means being essential when all said gas control ports are plugged.

4,711,181

WARHEAD WITH ROTATIONALLY-SYMMETRICAL HOLLOW CHARGE

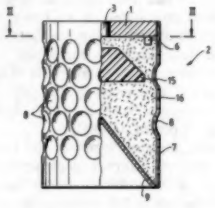
Konrad Ringel, Leinburg, and Karl Rudolf, Schrobenhausen, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 3, 1986, Ser. No. 937,221

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544747

Int. Cl.[4] F42B *3/08*

U.S. Cl. 102—476 **1 Claim**



1. A warhead comprising a rotationally-symmetrical hollow charge with selective central or eccentric triggering through a plurality of predeterminately positioned detonators; said warhead including a generally cylindrical casing having projectile-forming coverings thereon; a base plate closing one end of said casing; a jet-forming insert closing the opposite end of said casing; an explosive material filling said casing and adapted to be triggered by said detonators; said plurality of detonators being arranged in said base plate and including a central detonator and two additional detonators symmetrically spaced relative to said central detonator in a central principal plane longitudinal extending through said casing; and a rotationally-symmetrical deflector member being centrally arranged within the explosive material.

4,711,182
MAGNETIC SUSPENSION FOR A VEHICLE

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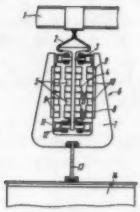
Filed Apr. 25, 1985, Ser. No. 727,272
Int. Cl.[4] B60L *13/04*
U.S. Cl. 104—283 **16 Claims**



1. A magnetic suspension for a vehicle for passenger and freight transportation along a track, comprising:

at least one guide rail vertically installed on the track, and having lateral sides of a magnetically conducting material;

an underframe surrounding said lateral sides of said guide rail and having a magnetic system;

a means for laterally stabilizing the position of said underframe;

first strips of permanent magnets extending in a longitudinal direction along the guideway, said first strips comprising a plurality of strips having pole facets which are arranged in an alternating polarity configuration in a vertical array;

second strips of permanent magnets extending in a substantially longitudinal direction of the vehicle, said second strips comprising a plurality of strips having pole facets which are arranged in an alternating polarity configuration in a vertical array;

said pole facets of said first strips having identical vertical spacing as said pole facets of said second polarity of the two sets of strips of permanent magnets interact to prevent excessive vertical displacement of the vehicle due to the proximity of the magnets to magnets of the opposite set of strips having the same polarity, the pole facets of said first and second strips which are horizontally spaced from each other having opposing polarity.

whereby the alternating polarity of the two sets of strips of permanent magnets interact to prevent excessive vertical displacement of the vehicle due to the proximity of the magnets to magnets of the opposite set of strips having the same polarity.

4,711,183
SHELVING ASSEMBLY WITH DROP-IN SHELF

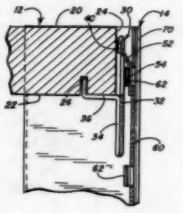
Milton E. Handler, Northbrook, and Herbert Baisch, Palatine, both of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Aug. 1, 1986, Ser. No. 892,700
Int. Cl.[4] A47B *57/24*
U.S. Cl. 108—111 **4 Claims**

1. A shelving assembly comprising:

at least one shelf, said shelf having a generally planar bottom horizontal surface, said shelf defining a groove that is parallel to said shelf margin and that opens to said shelf planar bottom horizontal surface;

a shelf support member engaging said shelf along a margin thereof, shelf support member including a generally planar vertical wall perpendicular to the plane of said shelf, said vertical wall having a top margin and a bottom margin, said shelf support member including a tab between said top and bottom margins of said vertical wall, said tab having an outwardly projecting portion and a downwardly extending portion spaced outwardly of, and parallel to, said shelf support member vertical wall, said shelf support member comprising a sheet of metal that defines said shelf support member vertical wall and that is folded over along said bottom margin to define another wall adjacent and parallel to said shelf support member vertical wall, said sheet being folded outwardly 90 degrees along



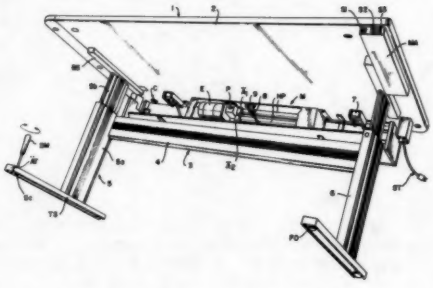
the upper edge of said other wall to define a generally horizontally oriented flange that is perpendicular to said shelf support member vertical wall, and said sheet being folded upwardly 90 degrees along the edge of said flange to define a lip that is generally perpendicular to said flange for being received in said shelf groove; and

vertical posts each including at least one vertical wall that is oriented generally parallel to said shelf support member vertical wall and each post including a receiving means on said post vertical wall for receiving said downwardly extending portion of one of said tabs with at least the distal end of said downwardly extending portion of said one tab being disposed adjacent said post vertical wall.

4,711,184
ARRANGEMENT FOR A DESK COMPRISING A DESK-TOP WHICH CAN BE RAISED AND LOWERED

P. O. Thomas Wallin; Bengt H. Warell; A. Pedar Svensson, all of Televerket, S-123 86 Farsta; Kurt A. Lundström, Televerket Industridivisionen, Svedjev 12, S-931 36 Skellefteå , and Lars A. Johansson, Kamomillgången 25, 61145 Nyköping, all of Sweden

Filed Nov. 18, 1985, Ser. No. 803,759
Claims priority, application Sweden, Mar. 16, 1984, 8401480
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—144 **4 Claims**



1. An improved height adjustable desk comprising:

a desk top;

at least two telescopic legs for raising and lowering said top with respect to a reference level, said telescopic legs having inner and outer parts;

a hydraulic cylinder including an associated piston extending inside each of said telescopic legs, said cylinder being fixed to the top and said piston being fixed to said outer part of said telescopic leg, said inner part being detachably connected to a first bar member releasably attached to the underside of the desk top;

means for actuating the hydraulic cylinders; and, wherein said inner and outer parts of said telescopic legs are made of closed profiles, an outer closed profile having a cross-section including a central substantially rectangular portion and two substantially rectangular side portions of reduced dimensions on each side of said central portion, and inner closed profile having a cross-section forming a corresponding central substantially rectangular portion and side portions on each side of said central portion, the inner walls of said central and side portions of said outer profile and outer walls of said corresponding central and side portions of said inner profile forming longitudinally extending mutually-coacting guiding surfaces counteracting jamming when said inner and outer parts are longitudinally movable with respect to each other for height adjustment of said desk.

4,711,185

PROCESS AND APPARATUS FOR THE DECOMPOSITION OF HALOGEN AND/OR PHOSPHORIC CONTAINING ORGANIC MATERIALS

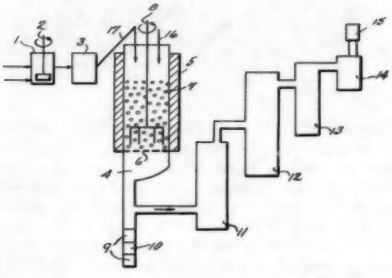
Jürgen Hofmann, Bad Orb; Hans Huschka, Hanau, and Daniel Neupert, Karlstein, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,120

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028193

Int. Cl.⁴ F23G *7/00*; F23B *7/00*; G21F *9/14*

U.S. Cl. 110—215 **2 Claims**



1. An apparatus suitable for the pyrolytic decomposition of an organic compound containing at least one element from the group consisting of halogen and phosphorus present in a waste material comprising a fixed bed reactor, a charge of substantially spherical ceramic structures resting on a sieve plate in said reactor, means for mechanically stirring said charge, means for supplying the organic compound into the upper part of the reactor, means for separately discharging the reaction gases and the solid reaction product formed in the reactor at the lower part of the reactor.

4,711,186

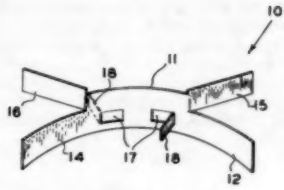
REFRACTORY ANCHOR

Te H. Chen, Florham Park; Dominic Cicchino, Morris Plains, and Peter J. Shadbolt, Morristown, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 22, 1986, Ser. No. 944,445

Int. Cl.⁴ E04B *1/24*

U.S. Cl. 110—336 **9 Claims**



1. A composite structure comprising: a metal surface; a refractory lining for providing thermal protection to said surface; and, a plurality of metal anchors welded to said surface in spaced apart relationship for providing crack control of said refractory lining during thermal cycling thereof, each of said anchors having a generally curved central web and curved legs extending from said central web, said central web and said legs defining substantially a semi-circle, straight arms extending upwardly from said curved central web, the total width of said anchor being substantially equal to the thickness of said refractory lining, said arms extending at a predetermined angle with respect to the diameter of said semi-circular web and leg portion of said anchor, said anchor having at least 1 hole and tab in said central web.

4,711,187

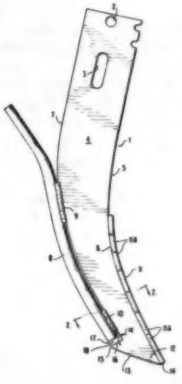
FERTILIZER APPLICATOR KNIFE AND ITS USE

Daryl Schultz, R.R. 2, Box 92-A, Rensslaer, Ind. 47979

Filed Sep. 23, 1985, Ser. No. 779,014

Int. Cl.⁴ A01C *23/02*

U.S. Cl. 111—7 **23 Claims**



1. A fertilizer knife for subsurface application of fertilizer in liquid or vapor form in a ground furrow, said knife comprising:

narrow, elongated blade means having a width W_1, a leading edge with a soil breaking segment and a trailing edge;

an elongated, hollow, fertilizer conduit means having a width W_2, wherein said conduit means is behind the trailing edge and is shaped to correspond to the trailing edge;

a foot portion on said blade means having a bottom edge

extending from the leading edge upwardly toward and beyond said trailing edge to form a rearwardly extending shoulder means therewith, wherein the shoulder means has an upwardly facing top surface that forms an obtuse angle with the vertical when the knife is in operating position;

wherein said conduit means terminates above and is spaced from said shoulder means to prevent back pressure in said conduit during movement of the knife through the furrow and to direct flow of fertilizer away from vertical walls of said furrow;

pieces of hard, abrasion-resistant material rigidly secured to and covering said soil-breaking segment forming a substantially flat surface generally perpendicular to the direction of travel having a width W_3 on the leading edge;

soil contacting surfaces rearwardly of said inserts on said blade and conduit, wherein the soil contacting surfaces are covered by a dried, abrasion-resistant coating;

and wherein $W_1 \cong W_2$ and $W_3 > W_1$.

4,711,188

PREPARATORY DEVICES FOR A POCKET SEWING MACHINE

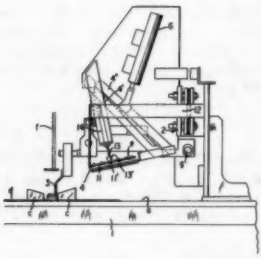
Katsuki Yoneda, Nishinomia, Japan, assignor to Satoh Seiki Co., Ltd., Japan

Filed Dec. 19, 1985, Ser. No. 810,504

Claims priority, application Japan, Jan. 17, 1985, 60-6737

Int. Cl.[4] D05B *3/12, 33/00*

U.S. Cl. 112—104 **1 Claim**



1. A pocket sewing machine comprising a sewing station and a preparatory device, said sewing station comprising a sewing needle, a cut knife, a triangle knife for an end cut, a stacker, a pair of base presses, a T-shaped center press and a cloth folder; said preparatory device being moveable along a sewing line of the sewing machine and comprising a press means for pressing a suit fabric and a supply means for supplying a pocket cloth, said sewing station and said preparatory device cooperating with each other such that while the pair of base presses of the sewing station are away from the starting position of the sewing machine, the press means of the preparatory device presses a suit fabric at the starting position of the next sewing cycle of the sewing machine and the pair of base presses return to said starting position and move upwards as the supply means for a pocket cloth moves downwardly.

4,711,189

SEWING ARRANGEMENT WITH FEED DEVICE

Richard Müller, Mehlbach; Roland Leis, and Axel Zinssmeister, both of Rothselberg, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,593

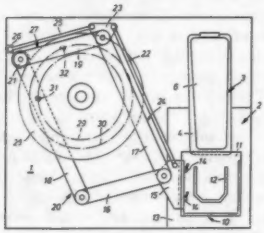
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 3607107

Int. Cl.[4] D05B *21/00, 27/00*

U.S. Cl. 112—121.12 **8 Claims**

1. A sewing arrangement including a sewing machine, a workpiece feed device including a workpiece holder, a support connectable to said workpiece holder, a workpiece drive device, a pitman drive connected to said workpiece drive device into said support, said pitman drive including parallel guide means pivotally connected to said support.

4. A device for moving a workpiece to accurately to move it through positions for sewing seams thereon, comprising a



sewing machine having a support, a work holder movable over said support with the work for moving the work in association with the sewing machine support and a pitman drive including a pivotal pitman support connected to said work holder, said pitman drive being connected to said pitman support and including a drive member, and parallel guiding means connected between said drive member and said pitman support.

4,711,190

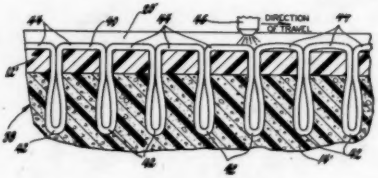
DECORATIVELY STITCHED TRIM PART AND METHOD

Jack E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 648,300, Sep. 6, 1984, abandoned, which is a division of Ser. No. 552,408, Nov. 16, 1983, Pat. No. 4,488,498. This application Aug. 22, 1986, Ser. No. 899,051

Int. Cl.[4] D05C *15/00*

U.S. Cl. 112—266.2 **1 Claim**



1. A method of providing a series of decorative stitches of continuous heat shrinkable thread on the visible outer surface of a trim part having an underlying substrate of relatively thicker resilient material with a hollow needle having a slanted end providing a leading piercing edge and a trailing notch, said series of decorative stitches including visible loops joined by intermediate loops embedded within said substrate so as to maintain said visible loops tensioned against said visible outer surface, comprising the steps of,

piercing the outer surface of said trim part with said needle piercing edge while capturing a portion of said thread on said notch,

penetrating said trim part with said needle and captured thread portion to an embedment distance less than the thickness of said trim part so as to position said captured thread portion in frictional retaining contact with said underlying substrate,

withdrawing said needle from said trim part a withdrawal distance above the outer surface thereof so as to leave an embedded loop in said substrate while continuously feed-

ing a sufficient length of thread through said hollow needle in response to the frictional retention of said thread portion to provide the combined length of a visible loop and one half the next embedded loop,

indexing said needle the length of a visible loop,

again penetrating said trim part with said needle and captured thread portion to said embedment distance so as to again position said captured thread portion in frictional retaining contact with said underlying substrate with said visible loop between said captured thread portions substantially tensioned against said visible outer surface,

repeating the foregoing steps until the desired series of decorative stitches is obtained, and

applying heat to said substantially tensioned visible loops so as to shrink them into tighter tension against said visible outer surface.

4,711,191

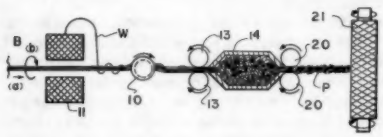
MONOFILAMENT-WRAP TEXTURIZING METHOD AND PRODUCT

Nathan G. Schwartz, Bryn Mawr, Pa., assignor to Technicservice, Kennet Square, Pa.

Filed Nov. 4, 1986, Ser. No. 926,800

Int. Cl.[4] D05C *17/02*; D02G *1/12, 3/24, 3/36*

U.S. Cl. 112—410 **8 Claims**



1. A stiff, pliable texturized yarn product comprising a bundle of heavy denier thermoplastic monofilaments, said filaments having a denier per filament of at least about 50 and being too stiff to be maintained as a bundle by air entangling for subsequent fabrication, and a wrapper yarn substantially continuously wrapped around said bundle,

said plurality of the monofilaments in said wrapped bundle having a multiplicity of heat-set bends repeating lengthwise along the lengths of said monofilaments.

7. A tufted woven floor covering comprising a base and a multiplicity of tufts having spring-like quality extending from said base, said tufts comprising stiff, pliable texturized yarn products as defined in claim 1.

4,711,192

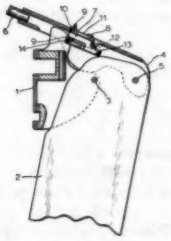
RUDDER ASSEMBLY

Wayne J. Kooy, Box 292, Galien, Mich. 49113

Filed Apr. 30, 1986, Ser. No. 857,247

Int. Cl.[4] B63H *25/06*

U.S. Cl. 114—162 **3 Claims**



1. An improved rudder assembly of the type comprising a rudder support frame (1), a rudder blade (2) pivotally attached to said rudder support frame (1) with a first pivot join (3) and a tiller frame (4) pivotally attached to said rudder blade (2) with a second pivot join (5), wherein the improvement comprises

a pivot bracket (7) attached to said tiller frame (4), and

a lever (12) pivotally attached near a first end with a third pivot join (14) to said rudder support frame (1) and pivotally attached near a second end with a fourth pivot join (13) to said pivot bracket (7) and rotatable about said third pivot join (14) from a first, substantially horizontal forward position having said fourth (13), third (14) and second (5) pivot joins in approximately a straight line to a second, substantially horizontal rearward position having said second (5), fourth (13) and third (14) pivot joins defining an obtuse angle approximating a straight line.

4,711,193

SELF-CONTAINED VENTILATION SYSTEM UNITS FOR SUPPLYING SPACES BETWEEN BULKHEADS WITH INDIVIDUALLY CIRCULATED VENTILATION AIR

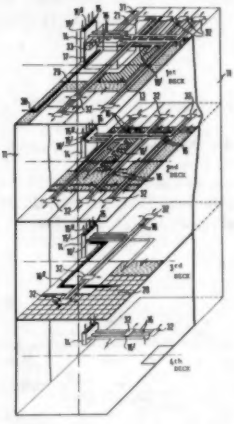
Joachim Latza, Hamburg-Norderstedt, and Günther Möck, Hamburg, both of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 868,940

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519394

Int. Cl.[4] B63J *2/14*

U.S. Cl. 114—211 **21 Claims**



1. A ship with an air conditioning system, said ship comprising a plurality of vertically-shaped decks and a ship bottom within a hull, said decks comprising an uppermost deck and at least one lower deck, said at least one lower deck comprising at least one deck adjacent said uppermost deck;

said hull having a longitudinal direction and a transverse direction;

a plurality of bulkheads disposed vertically within said hull for dividing said hull into a plurality of separate spaces one behind the other along said longitudinal direction of said hull;

first means for providing air for ventilation solely to at least a first of said plurality of separate spaces between at least two of said bulkheads;

said first air providing means having ducting;

first means for conducting and removing ventilation air solely to at least said first space;

second means for conducting and removing ventilation air;

said first air conducting and removing means disposed for providing air solely to said first of said plurality of separate spaces;

said second air conducting and removing means being disposed to conduct and remove ventilation air solely from at least a second of said plurality of said separate spaces other than said first of said separate spaces; and

said first air conducting and removing means having a portion thereof disposed solely between and other than through any of said at least two bulkheads of said at least first space, whereby air conducted into and discharged from said first space is excluded from at least said second space and air conducted and discharged from said second space is excluded at least from said first space;

said first and said second separate air providing means each having separate ducting, wherein said ducting of each of said separate air providing means comprises at least one substantially vertical air shaft which extends through all said vertically-spaced decks for ventilation of deck spaces thereinbetween;

each said at least one shaft having substantially adjacent, substantially vertical ducts for incoming air, circulating air and exhaust air, and also each said substantially vertical duct having its corresponding horizontal duct connected thereto for incoming air, circulating air and exhaust air respectively, said horizontal ducts branching off solely from corresponding ones of said vertical ducts, of their corresponding separate air providing means, into individual ones of said deck spaces;

each of said first and said second air providing means having its own separate air conditioner unit for air conditioning at least said circulating air and means for connecting each said air conditioning unit to its corresponding air ducts.

4,711,194

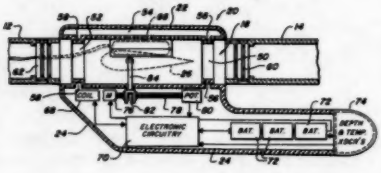
STREAMER INTERFACE ADAPTER CABLE MOUNTED LEVELER

John T. Fowler, Marblehead, Mass., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 444,073, Nov. 24, 1982, and a continuation-in-part of Ser. No. 585,027, Mar. 5, 1984. This application Jan. 11, 1985, Ser. No. 690,867

Int. Cl.[4] B63G *8/14*

U.S. Cl. 114—245 **12 Claims**



1. A cable leveling device adapted to be attached to a streamer cable comprising:

an adapter module adapted to be secured between two streamer cable sections, said module including an inner housing adapted to be attached at either end to a section end and an overlying housing adapted to rotate about said inner housing and including wings mounted to said overlying housing for rotation about a horizontal axis, said overlying housing including, an elongated weighted pod-like structure containing apparatus operably connected to control said wings, wherein:

said adapter module includes a first coil electrically connected to said streamer cable,

said overlying housing includes a second coil inductively coupled to said first coil and connected to electro-mechanical means, permitting an exchange of signals between said cable at said electro-mechanical means.

4,711,195

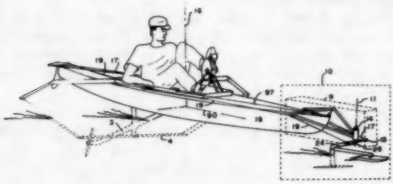
HYDROFOIL APPARATUS

Sidney G. Shutt, 612 Briarwood Dr., Brea, Calif. 92621

Filed Apr. 10, 1987, Ser. No. 37,156

Int. Cl.[4] B63B *35/00*

U.S. Cl. 114—274 **12 Claims**



1. A hydrofoil apparatus for attachment to a marine vessel comprising:

a first pivot means for positioning the rotational axis of a gooseneck shaft substantially parallel to the yaw axis of the hull of said marine vessel,

a trailing load support having a forward end pivotally coupled to said gooseneck shaft for rotation on said yaw axis, and an aft end;

a planing surface sensor having a planing surface in contact with the water surface, said planing surface providing a hydrodynamic force to hold said planing surface on the water surface in response to vessel forward velocity,

an elongated body member having a forward end and an aft end, said forward end being pivotally coupled to rotate on a first pitch axis with respect to said planing surface sensor, said elongated body member being pivotally coupled to rotate on a second pitch axis passing through a point located between said elongated body forward and aft ends and said trailing load support aft end,

a vertical fin coupled to elongated body member, said fin being responsive to the forward motion of said marine vessel to maintain said planing surface sensor forward of said second pitch axis,

a lifting foil coupled to said vertical fin, said lifting foil being responsive to the forward motion of said marine vessel to raise the bow of said marine vessel by provide a lifting force via said second pitch axis to balance the lifting force provided by said planing surface sensor applied to said first pitch axis.

4,711,196

MARINE SURVIVAL SYSTEM

Thomas M. Wilks, Lymington, United Kingdom, assignor to Laggan Marine Developments Limited, Lymington, United Kingdom

Continuation-in-part of Ser. No. 813,371, Dec. 26, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 934,845

Claims priority, application United Kingdom, Jan. 7, 1985, 8500359

Int. Cl.[4] B63B *23/00*

U.S. Cl. 114—365 **17 Claims**

1. A marine survival system for a vessel (including a marine platform) comprising:

a lifecraft;

an unmanned tug having a bow and a stern between which is defined a fore-and-aft direction of said tug;

a towline connected between the bow of the lifecraft and a center of neutral steer of the tug;

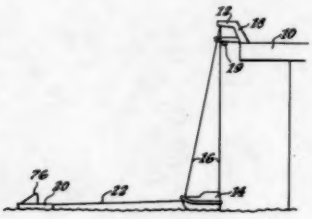
a first launching means by which the lifecraft is stowed on the vessel, said first launching means including releasable falls and braked winch means controlling pay-out of the falls so that the lifecraft is lowered slowly to the sea;

a second launching means by which the tug is stowed on the

vessel, said second launching means including a release permitting the tug to drop to the sea;

autopilot means in said tug operatively connected to a rudder of the tug to angle the rudder as called for by a predetermined compass heading;

a sensor in the tug responsive to a direction of pull in the towline and having an output a state of which changes depending upon a magnitude and a direction of a deviation of said pull from the fore and aft direction of the tug;



a trim control of the autopilot means responsive to the state of the sensor output to adjust an effective compass heading to maintain the tug on a predetermined track relative to the lifecraft; and

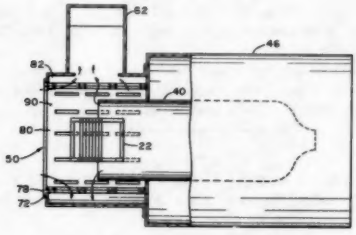
release means operably connected to the winch means and to the tug release so that on actuation of the release means the tug falls into the sea and deploys to an extremity of the towline on the predetermined compass heading and track as the lifecraft is slowly lowered to the sea and on release of the falls tows the lifecraft away from the vessel.

4,711,197

GAS SCAVENGER

Jerry A. Taylor, Sr., Corona, Calif., assignor to Thermco Systems, Inc., Orange, Calif.

Filed Oct. 16, 1986, Ser. No. 919,736
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—715 **8 Claims**



1. A gas scavenger for educting gas away from semiconductor wafers as the wafers are withdrawn from a processing chamber along a path, comprising:

a peripheral outer wall defining a plenum having opposite ends, the one end in gas flow communication with the processing chamber and the second end in gas flow communication with the atmosphere, the outer wall having a gas exhaust port in gas flow communication with a gas exhaust system, and

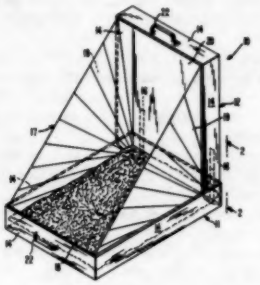
an interior wall dividing the plenum into a first chamber through which the wafers travel and a second chamber in gas flow communication with the gas exhaust port in the outer wall, the interior wall having apertures about the path of wafer travel.

4,711,198

THROW AWAY CAT LITTER BOX

George R. Mossbarger, 7000 Ebenezer Church Rd., Raleigh, N.C. 27612

Filed May 27, 1986, Ser. No. 866,947
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—1 **11 Claims**



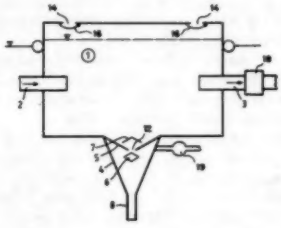
1. A disposable cat litter container having prepackaged cat litter therein for receiving and collecting cat waste comprising: a cardboard box structure including upper and lower mating half sections wherein the upper half section includes a top panel with a surrounding side wall structure and wherein the lower half section includes a bottom panel with a surrounding side wall structure; means for pivotably mounting the upper and lower sections together to enable the upper half section to move between a generally horizontal closed position and a generally vertical upper position; an impervious flexible liner secured internally to the upper and lower half sections and including a bottom portion extending over the bottom panel and an upper portion secured to the upper half section; said flexible liner forming a pair of flexible and collapsible side walls that extend vertically between the upper and lower half sections when the upper half section assumes the open position, each flexible side wall assuming generally triangular shape and functioning to close opposite sides of the cardboard box structure when the same is in the open position; and cat litter overlying the bottom portion of the liner and disposed within the cardboard box structure.

4,711,199

DEVICE FOR BREEDING FISH AND SHELLFISH

Lars-Erik Nyman, Enebyberg, Sweden, assignor to Flygt AB, Solna, Sweden

Filed Aug. 21, 1986, Ser. No. 899,200
Claims priority, application Sweden, Aug. 23, 1985, 8503939
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 **2 Claims**



1. In a system of tanks for breeding fish and the like for use in a liquid environment, apparatus comprising in combination:

a first cylindrical fish tank of a non-rigid material having a first inlet and a first outlet, said first inlet and outlet being

below the surrounding liquid line and dimensioned so that the liquid in said first tank is at a level higher than the liquid environment surrounding said first tank, and said first inlet is directed tangentially to said first tank and said first outlet is directed tangentially from said first tank, whereby a rotating liquid flow is created in said first tank;

first means extending from the bottom of said first tank for collecting sludge and gas, said first means including

a first conically shaped hopper having a first cover inclined toward the center of the hopper and defining a first central hole,

a first screening member located adjacent said first central hole for preventing gas from entering said tank and for permitting collection and evacuation of the gas at the upper interior periphery between said first hopper and cover walls,

a first protection screen positioned over said first central hole to prevent dead fish and the like from falling into said hopper, and

a first sludge outlet extending from the narrow portion of said conical hopper;

a feed line coupled to said first inlet; and

a sludge line coupled to said first sludge outlet to transport the sludge to a collecting tank.

4,711,200

AUTOMOTIVE-ENGINE FUEL SUPPLY SYSTEM

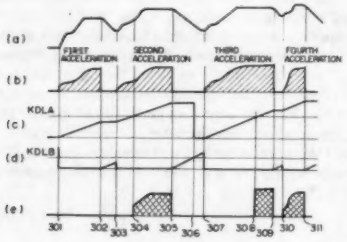
Yoshiaki Kinoshita, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 11, 1986, Ser. No. 906,313

Claims priority, application Japan, Sep. 13, 1985, 60-201831

Int. Cl.[4] F02D *41/10*

U.S. Cl. 123—492 **2 Claims**



1. An electronically controlled fuel supply system for an internal combustion engine, which comprises:

(a) means responsive to a volume of intake air per revolution of the engine for computing a basic fuel supply amount per revolution;

(b) means responsive to engine speed and engine load for computing an additional fuel supply amount;

(c) means responsive to an accelerating condition of the engine for monitoring a time interval between successive acceleration cycles of the engine;

(d) means, responsive to said means for monitoring a time interval between successive acceleration cycles, for setting a variable delay time which increases in response to an increase in said time interval; and

(e) electronically operated fuel supply means, responsive to said means for setting a variable delay time, for supplying the engine for each revolution thereof with fuel in an amount substantially equal to said basic fuel supply amount when an actual acceleration period counted from commencement of each acceleration cycle is less than said delay time and in an amount substantially equal to a sum of said basic and additional fuel supply amounts when the actual acceleration period from the commencement of an acceleration cycle exceeds said delay time.

4,711,201

TWO-CYCLE ENGINE

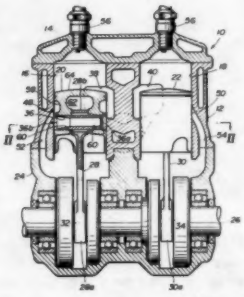
Kazuo Ooyama, Niiza; Kenji Ooki, Asaka, and Toshio Mizushima, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Feb. 12, 1986, Ser. No. 828,856

Claims priority, application Japan, Feb. 15, 1985, 60-27952; Feb. 15, 1985, 60-27954

Int. Cl.[4] F16J *1/14*

U.S. Cl. 123—73 A **9 Claims**



1. A two-cycle engine comprising:

(a) an engine body having at least one cylinder, said cylinder having an exhaust port and at least one scavenge port disposed generally in opposed relation to said exhaust port;

(b) a crankshaft rotatably mounted on said engine body;

(c) a piston received in said cylinder for reciprocal movement therealong and having an outer peripheral surface for closing said exhaust and scavenge ports during the reciprocal movement thereof, said piston having a transverse bore extending therethrough with opposite ends of said transverse bore opening to the outer peripheral surface of said piston, and the opposite ends of said transverse bore being positioned so as to come into facing relation to said opposed exhaust and scavenge ports, respectively, during the reciprocal movement of said piston;

(d) a hollow wrist pin received in said transverse bore and retained therein, one end of said wrist pin being closed and being positioned so as to come into facing relation with said exhaust port; and

(e) a connecting rod connected between said crankshaft and said wrist pin for moving said piston along said cylinder upon rotation of said crankshaft.

4,711,202

DIRECT ACTING CAM-VALVE ASSEMBLY

Steven F. Baker, Bellevue, Ohio, assignor to General Motors Corporation, Detroit, Mich.

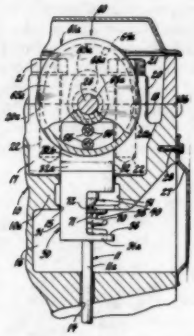
Filed Oct. 30, 1986, Ser. No. 924,826

Int. Cl.[4] F01L *1/30*

U.S. Cl. 123—90.26 **3 Claims**

1. A direct acting cam-valve assembly for an internal combustion engine having an engine block means defining a cylinder with a port and a valve with a valve stem reciprocably guided in said engine block means and located for axial movement in said port, a camshaft with a double cam rotatably supported by the engine block means in a position above and in spaced apart relationship to said valve, said double cam including therein an internal track means defining an cam means and an outermost cam means, a follower guide bore in said engine block means, a cam follower reciprocably journaled in said follower guide bore, first and second sets of roller followers spaced parallel to each other operatively connected adjacent to one end of said cam follower with said first set of said roller

followers operatively engaging said innermost cam means and said second set of said roller followers operatively engaging said outermost cam means whereby said cam follower is reciprocated during rotation of said camshaft, the opposite end of said cam follower having a stepped bore therethrough defining in succession from its outboard end a cylinder lower wall to



loosely receive a free end of said valve stem of said valve, a spring cavity and a hub wall, a hydraulic lash adjuster operatively positioned in said hub wall in position whereby one end thereof will abut against the free end of said valve stem, and a spring operatively positioned in said spring cavity and operatively connected to said valve stem to normally bias said valve in an axial direction toward said one end of said cam follower.

4,711,203

TIMING CASE FOR A CYLINDER HEAD OF INTERNAL COMBUSTION ENGINES HAVING GAS CHANGING VALVES ARRANGED ESSENTIALLY IN PARALLEL TO ONE ANOTHER

Jiri Seidl, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

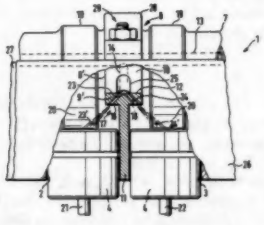
PCT No. PCT/EP85/00521, § 371 Date Jun. 12, 1986, § 102(e) Date Jun. 12, 1986, PCT Pub. No. WO86/02700, PCT Pub. Date May 9, 1986

PCT Filed Oct. 5, 1985, Ser. No. 874,163

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1984, 3439553

Int. Cl.[4] F01M *1/06*

U.S. Cl. 123—90.34 **7 Claims**



1. A timing case for a cylinder head of internal-combustion engines having gas changing valves arranged essentially in parallel to one another that are actuated by separate cams on a single camshaft disposed in the timing case, via tappets that are guided by breakthroughs of the timing case, said breakthroughs being arranged adjacently while leaving a web, and said web, on a side of the camshaft being connected with a bottom part of a divided camshaft bearing, an axial width of said camshaft bearing in an area of the smallest wall thickness of the web, exceeding said smallest wall thickness, wherein the timing case is developed separately from the cylinder head, and wherein the breakthroughs disposed transversely with respect to the camshaft bearing end approximately in the area of the smallest wall thickness of the web at a predetermined distance from the bearing surface in the bottom part of the bearing in such a way that on both sides of the web a bearing wall remains at the bottom part of the bearing that has said bearing surface, said bearing wall being integral with the web.

4,711,204

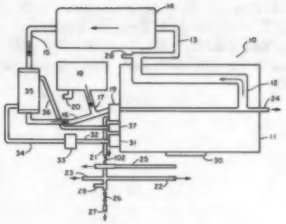
APPARATUS AND METHOD FOR COLD WEATHER PROTECTION OF LARGE DIESEL ENGINES

David M. Rusconi, P.O. Box 2846, Redwood City, Calif. 94064

Filed Aug. 8, 1983, Ser. No. 521,436

Int. Cl.[4] F02N *17/02*

U.S. Cl. 123—142.5 R **12 Claims**



9. Method as in claim 8 further providing that said small diesel engine is capable of providing a second powered drive shaft available for other optional purposes.

4,711,205

INJECTION START ADVANCER FOR FUEL INJECTION PUMP ASSEMBLY OF THE FUEL DISTRIBUTION TYPE

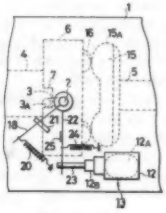
Satoru Ito, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1986, Ser. No. 946,185

Claims priority, application Japan, Jan. 20, 1986, 61-5125[U]

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—179 L **3 Claims**



1. An injection start advancer in a fuel injection pump assembly of the distribution type, comprising:

a pump housing;

a drive shaft rotatably supported by said pump housing;

a plunger coupled to said drive shaft and rotatable and reciprocable thereby for delivering fuel under pressure;

injection timing control means disposed between said drive shaft and said plunger for controlling timing for axial displacement of said plunger;

a shaft extending through said pump housing and rotatably supported thereby;

engagement means fixed to a portion of said shaft within said pump housing for engaging said injection timing control means;

a first lever fixed to a portion of said shaft outside of said pump housing;

a first spring acting on said first lever for normally urging said injection timing control means in a direction to advance fuel injection;

a second lever loosely fitted over said shaft;

a heat-sensitive material contractable and expandable according to ambient temperature; and

a second spring acting on said second lever for normally urging the same in a direction to apply a pressure to said heat-sensitive material, said second lever serving as a stopper for limiting an angular position of said first lever.

4,711,206

TWO-CHAMBER ENGINE MOUNT WITH HYDRAULIC DAMPING

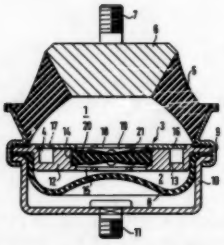
Rainer Andrii, Limburg, and Manfred Hofmann, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 889,478

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526686

Int. Cl.⁴ F02B *75/06*

U.S. Cl. 123—192 R **7 Claims**



1. Two-chamber engine mount with hydraulic damping, comprising rubber-elastic peripheral walls, a rigid intermediate plate disposed within said peripheral walls defining two chambers along with said peripheral walls being acted upon by vibrations induced in a given direction, hydraulic fluid filling said chambers, said intermediate plate having substantially planar upper and lower surfaces, said intermediate plate having a channel formed therein interconnecting said chambers, said intermediate plate having another chamber formed therein, said upper and lower surfaces of said intermediate plate having perforations formed therein above and below said other chamber defining a liquid-permeable cage, and a circular rubber-elastic membrane disc having two sides and a center with a reduced thickness, said membrane disc being loosely disposed in said other chamber, both of said sides of said membrane disc being acted upon by said hydraulic fluid moving said membrane disc parallel to said given direction for combined frequency and amplitude decoupling.

4,711,207

VALVE DEACTIVATOR MECHANISM

Duane J. Bonvallet, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

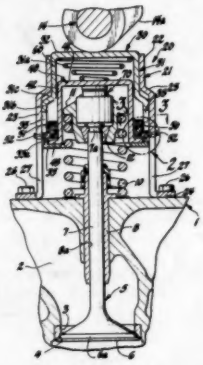
Filed Apr. 7, 1987, Ser. No. 35,181

Int. Cl.⁴ F02D *13/06*; F01L *13/00*

U.S. Cl. 123—198 F **4 Claims**

1. A valve deactivator mechanism for use in an internal combustion engine of the type having an engine block means defining a cylinder with a port, a poppet valve operatively positioned to control flow through the port and having a valve stem reciprocably journaled in the cylinder head with one end thereof extending outboard of the cylinder head with a valve spring associated therewith to normally bias the poppet valve to a valve closed position in the port, and an engine driven valve actuator means spaced from the poppet valve, the improvement comprising;

a tubular cam follower guide housing means operatively fixed to the cylinder head substantially concentric with and encircling the valve stem of the poppet valve; a cam follower of inverted cup-shaped configuration slidably journaled for reciprocation in said cam follower guide housing means, said cam follower having a foot at one end thereof positioned to be engaged by the valve actuator means and a radially inward extending annular flange at its opposite end to define a solenoid pole piece; a valve actuator of inverted cup-shaped loosely positioned in said cam follower and operatively connected to the valve stem of the poppet valve, said valve actuator having a closed end at one end thereof and having at its open end a radially



outward extending annular flange defining an armature; a spring means operatively positioned between said closed end of said valve actuator and the foot of said cam follower to normally bias the said flanges of said cam follower and of said valve actuator into abutment with each other; and, a solenoid coil and bobbin means fixed to said cam follower guide housing means so as to loosely encircle said valve actuator and positioned to generate an electromagnetic flux path when said solenoid coil is energized that passes through the opposed working surfaces of said flanges whereby said valve actuator is electromagnetically connected to said cam follower for movement therewith, the arrangement being such that when the said solenoid coil is deenergized, said valve actuator is operatively uncoupled from said cam follower to effect deactivation of the poppet valve.

4,711,208

PISTON FOR INTERNAL COMBUSTION ENGINES

Wilfried Sander, and Siegfried Mielke, both of Neckarsulm, Fed. Rep. of Germany, assignors to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany

Continuation of Ser. No. 641,532, Aug. 16, 1984, abandoned. This application Apr. 11, 1986, Ser. No. 851,881

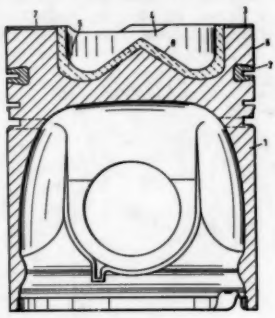
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330554

Int. Cl.⁴ F02B *19/00*

U.S. Cl. 123—271 **13 Claims**

1. In a piston for an internal combustion engine, particularly for a supercharged diesel engine, comprising a piston head with a combustion chamber recess and having a heat-insulating layer of ceramic material having a low heat conductivity, the improvement wherein the piston head has a portion surrounding the recess and the recess includes an upwardly extending central conical walled portion and one part of the heat-insulating layer comprises a solid ceramic insert having a wall thick-

ness of 3 mm to 10 mm wherein all of the combustion chamber recess is defined by the ceramic insert and the ceramic insert held in position by shrinkage fit and by form-locking, and another part of the heat insulating layer comprises a ceramic



coating separate from said insert and having a thickness of 0.6 to 2 mm which is disposed on a top surface of the piston head surrounding the recess and the ceramic coating extends from the combustion chamber recess at least to an edge of the piston head and is firmly adhered to the piston top surface.

4,711,209

FUEL INJECTION SYSTEM FOR SELF-IGNITION INTERNAL COMBUSTION ENGINES

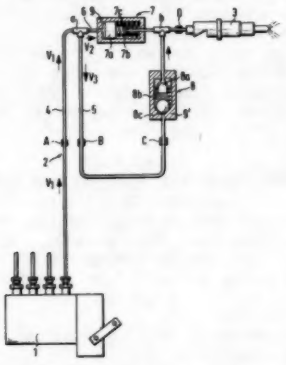
Dietmar Henkel, Neumarkt, Fed. Rep. of Germany, assignor to MAN Nutzfahrzeuge GmbH, Nuremberg, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,056

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516537

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—300 **11 Claims**



1. In a fuel injection system combined into one unit, for self-ignition internal combustion engines operative with speed and load of such engine respectively, that includes an injection pump which delivers metered fuel quantities with a level and a time pattern of pump pressure, at periodic intervals, via a connecting line to an injection means including a main injection feed line having an outlet end, with at least part of said connecting line comprising two different-length circuits which are connected in parallel and which cause the fuel quantity supplied to the feed line to be divided such that, on the one hand, a small fuel quantity in a first pre-injection phase (pre-injection quantity) passes through the shorter circuit to said injection means and, on the other hand, a larger fuel quantity in a second main injection phase (time-delay circuit), with the two fuel quantities of the first and second phases respectively reaching said injection means with an exact time lag relative to one another, the improvement therewith comprising:

a metering valve unit disposed in said shorter circuit to permit a quantity of fuel for the pre-injection phase to be metered which remains constant at all times subject to point of commencement of the pre-injection phase being accurately set practically independent of the level and the time pattern of the pump pressure and being practically independent of speed and load of the engine; and

a check valve unit disposed in said longer time-delay circuit at that end thereof closest to said injection means, with the ratio of the diameter of said feed line, including said shorter circuit, to the diameter of said time-delay circuit being in a range of between 1 and 2, said check valve unit ensuring satisfactory hydraulic uncoupling of the two fuel injection phases (pre-injection and main injection quantities) effected at the same time intervals at all times, said check valve unit also preventing pressure and volume waves of the first pre-injection phase from entering the outlet end of the main injection feed line and as a result no volume losses of the pre-injection quantity and metering inaccuracies liable to be produced therewith will occur nor are there any multiple reflections of pressure waves alternately entering into either line and any resultant interference with pre-injection and main injection phases can be successfully avoided.

4,711,210

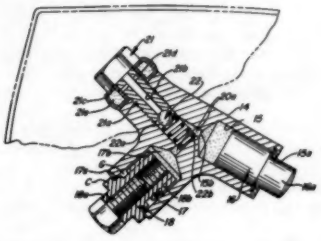
COMPRESSION BRAKING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Dean H. Reichenbach, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 29, 1986, Ser. No. 946,815

Int. Cl.⁴ F02D *13/04*

U.S. Cl. 123—321 **6 Claims**



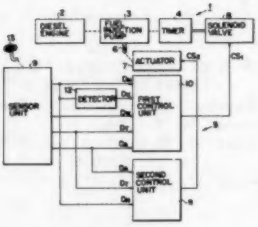
1. In a multi-cylinder internal combustion engine having fuel injecting means for each cylinder, first actuating means for operating the fuel injecting means, exhaust valve means for each cylinder biased to assume a closed position, and second actuating means for opening the exhaust valve means; a compression braking system comprising a housing for disposition proximate the first and second actuating means of each cylinder, said housing including a first cavity in which a first piston is reciprocally mounted, a portion of said first piston protruding from one end of the first cavity and being engaged and moved by said first actuating means, a second cavity angularly disposed relative to said first cavity and proximate a second end of said first cavity, a second piston reciprocally mounted within said second cavity and having a portion thereof protruding from one end of the second cavity for engaging and moving the second actuating means when the engine is in a compression braking mode, and a third cavity proximate said first and second cavities and having a portion thereof forming a linkage passage interconnecting a second end of the second cavity to the second end of the first cavity; normally closed

check valve means disposed within said third cavity; a connector piece having a first section provided with an elongated first passage and disposed within said third cavity and on the opposite side of said check valve means from the linkage passage, and a protruding second section having a second passage communicating with the first passage formed in said first section, said second passage forming a segment of a flow circuit through which hydraulic fluid circulates; during a predetermined engine operating mode, said linkage passage being filled with hydraulic fluid from the flow circuit whereby inward movement of said first piston into the said first cavity is transmitted via the linkage passage hydraulic fluid to said second piston affecting outward movement thereof whereby said second actuating means opens the cylinder exhaust valve means.

4,711,211
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Hidekazu Oshizawa, and Kenji Okamoto, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd.

Continuation of Ser. No. 692,391, Jan. 17, 1985, abandoned. This application Jul. 7, 1986, Ser. No. 883,294
Claims priority, application Japan, Jan. 19, 1984, 59-6351
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—357 **4 Claims**



1. A fuel injection apparatus for an internal combustion engine in which the fuel injection timing and the amount of fuel injection are controlled in response to at least one condition signal indicating the operating condition of the engine, comprising:

a first control means responsive to the condition signal for calculating and outputting a target timing data representing an optimum timing of fuel injection;

a timer means responsive to the target timing data for adjusting the fuel injection timing so as to obtain the optimum timing;

a data producing means responsive to the condition signal for producing a quantity data representing the amount of fuel injection required for the operating condition of the engine;

a second control means responsive to a signal indicating an engine speed at each instant and to the target timing data for calculating and outputting a full amount data indicating a maximum fuel injection quantity for the operating condition of the engine at each instant which is determined so that the amount of smoke produced at the maximum fuel injection quantity determined by the full amount data is a predetermined upper limit;

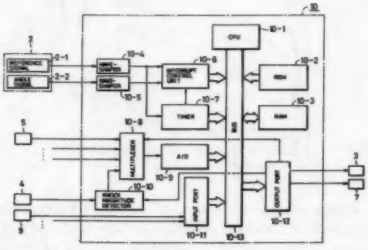
a selecting means responsive to the quantity data and the full amount data for selecting the lesser of the two data; and

actuator means responsive to an output of said selecting means for controlling the fuel injection quantity, whereby the amount of smoke produced by the fuel injection quantity does not exceed the predetermined upper limit during each adjustment of the fuel injection timing by said first control means and said timer means and a full power condition can be obtained with a minimum of smoke irrespective of changes in the fuel injection timing.

4,711,212
ANTI-KNOCKING IN INTERNAL COMBUSTION ENGINE

Hiroshi Haraguchi, Kariya, and Koji Sakakibara, Hekinan, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 21, 1986, Ser. No. 933,611
Claims priority, application Japan, Nov. 26, 1985, 60-266989; Dec. 4, 1985, 60-273097; Jun. 12, 1986, 61-137152; Jul. 31, 1986, 61-181795
Int. Cl.[4] F02P *5/145*
U.S. Cl. 123—425 **21 Claims**



1. A system for controlling knocking in an internal combustion engine, comprising:

a knock sensor for outputting a signal in response to the vibrations in said engine;

means for deriving a knock magnitude value from the output signal of said knock sensor generated within a predetermined engine rotational angle at an interval thereby obtaing a plurality of knock magnitude values, said knock magnitude value corresponding to the magnitude of a knock component of said output signal of said knock sensor;

means for determining a pattern of distribution of said plurality of said knock magnitude values on the basis of the results of comparison between the frequency that said knock magnitude value exceeds an upper threshold value and the frequency that the knock magnitude value goes below a lower threshold value;

means for detecting a knocking condition of said engine in accordance with the determined distribution pattern; and

means for controlling said engine to prevent the knocking in accordance with the detected knocking condition.

4,711,213
KNOCK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Koji Sakakibara, Hekinan, and Hiroshi Haraguchi, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 10, 1986, Ser. No. 850,164
Claims priority, application Japan, Apr. 11, 1985, 60-77066
Int. Cl.[4] F02P *5/04*
U.S. Cl. 123—425 **13 Claims**

1. A knock control system for use with an internal combustion engine, comprising:

a knock sensor for detecting knock produced by the internal combustion engine;

knock discriminating means for discriminating knock based on an output signal from said knock sensor;

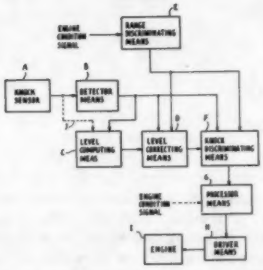
processor means responsive to the result of knock discrimination for computing a control value to control a knock control factor for the internal combustion engine;

driver means responsive to said control value for varying said knock control factor;

detector means for detecting the maximum value of said output signal from said knock sensor during a prescribed period of time;

level computing means for computing a knock discrimination level to be compared with said maximum value;

range discriminating means for ascertaining whether the operating condition of the internal combustion engine is in or outside of a knock control range in which knock is substantially produced, and for enabling said processor means to control said knock control factor according to the result of knock discrimination by said knock discriminating means when the operating condition of the internal combustion engine is in said knock control range; and



level correcting means for correcting said knock discrimination level such that a probability that said maximum value will exceed said knock discrimination level is greater in said knock control range than outside of said knock control range, said knock discriminating means being arranged to discriminate knock in said knock control range according to the knock discrimination level as corrected by said level correcting means.

4,711,214

ANTI-KNOCKING CONTROL IN INTERNAL COMBUSTION ENGINE

Koji Sakakibara, Hekinan; Hiroshi Haraguchi, and Hideki Yukumoto, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

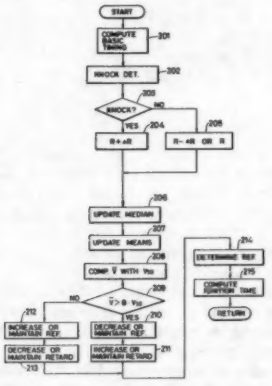
Continuation of Ser. No. 735,108, May 17, 1985, Pat. No. 4,617,895. This application Jul. 31, 1986, Ser. No. 891,165

Claims priority, application Japan, May 17, 1984, 59-99898; Dec. 13, 1984, 59-264256; Mar. 4, 1985, 60-43223

The portion of the term of this patent subsequent to Oct. 2, 2003, has been disclaimed.

Int. Cl.[4] F02P 5/15

U.S. Cl. 123—425 **12 Claims**



1. Apparatus for controlling knocking in an internal combustion engine, comprising:

a knock sensor for generating a signal in response to the vibrations in said engine;

means for measuring a predetermined magnitude of said knock sensor signal generated within a predetermined engine rotational angle at an interval thereby obtaining a plurality of said magnitudes;

means for determining a pattern of distribution of a plurality of logarithmic values corresponding to said plurality of magnitudes; and

means to control said engine to prevent said knocking in accordance with said distribution pattern.

4,711,215

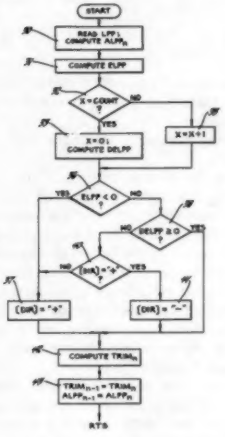
LPP COMBUSTION CONTROL FOR IC ENGINE WITH ABNORMAL COMBUSTION

Kenneth J. Cinpinski, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1986, Ser. No. 923,577

Int. Cl.[4] F02P 5/15

U.S. Cl. 123—425 **3 Claims**



1. An LPP ignition timing control for an internal combustion engine including a combustion chamber, means effective to ignite a combustible charge within the combustion chamber and power output apparatus including a rotating crankshaft driven in response to the expansion of the combustible charge following the ignition thereof and having a predefined TDC rotational reference position, the ignition timing control comprising, in combination:

means for periodically sensing LPP in the combustion chamber and generating an average LPP value therefrom;

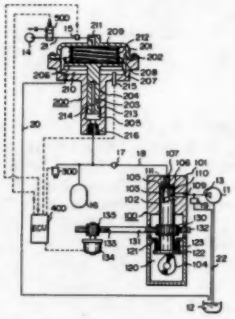
means for generating a DLPP value indicating a desired LPP;

means responsive to both of the aforementioned means for periodically adjusting ignition timing (1) in the advance direction if the average LPP value is retarded with respect to the DLPP value, (2) in the same direction as the previous adjustment if the average LPP is advanced and becoming less advanced with respect to the DLPP value, or (3) in the opposite direction from that of the previous adjustment if the average LPP is advanced and becoming more advanced with respect to the DLPP value, whereby MBT timing is maintained in spite of a foldover effect in the relationship between LPP and ignition timing.

4,711,216
FUEL SUPPLY DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Yasuhiro Takeuchi, Okazaki; Yasuyuki Sakakibara, Nishio; Toshihiko Igashira, Toyokawa, and Hidetaka Nohira, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed May 14, 1986, Ser. No. 863,151
Claims priority, application Japan, May 16, 1985, 60-102742
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—447 13 Claims



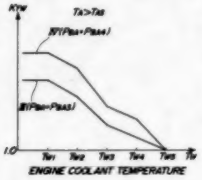
1. A fuel supply device for a diesel engine comprising:
first sensing means for sensing an accelerator position of said diesel engine;
second sensing means for sensing a rotational speed of said diesel engine;
pump means for pressurizing fuel to a high pressure and discharging the highly pressurized fuel;
regulator means for regulating the pressure of said highly pressurized fuel discharged from said pump means, said regulator means including an electrically-operated member for varying the pressure of said highly pressurized fuel in accordance with a first electrical signal applied thereto;
electrically-operated injector means for injecting said highly pressurized fuel regulated by said regulator means into said diesel engine in accordance with a second electrical signal applied thereto; and
control means for controlling said electrically-operated member and said injector means, said control means producing said first electrical signal in accordance with the rotational speed sensed by said second sensing means so that the pressure of said highly pressurized fuel discharged from said pump means regulated to a higher pressure as the sensed rotational speed is increased, and said control means producing said second electrical signal in accordance with the rotational speed sensed by said second sensing means and the accelerator position sensed by said first sensing means so that a timing and interval of a fuel injection by said injector means are varied in accordance with the sensed rotational speed and the sensed accelerator position.

4,711,217
FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT LOW TEMPERATURE

Hidekazu Kano, Higashimatsuyama; Takashi Shinchi, Kawagoe, and Shuichi Hosoi, Ichikawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1986, Ser. No. 840,460
Claims priority, application Japan, Mar. 18, 1985, 60-052508
Int. Cl.[4] F02D *41/06*; F02M *51/00*
U.S. Cl. 123—491 5 Claims

1. A method of controlling the quantity of fuel being supplied to an internal combustion engine in a cold state, wherein a basic value of the quantity of fuel being supplied to said engine is corrected by the use of a first correction value which is set based upon a difference between a predetermined value and an actual value of temperature of intake air being supplied to said engine and a second correction value which is set based upon a temperature of said engine and a load on said engine, said second correction value being applied when said engine is

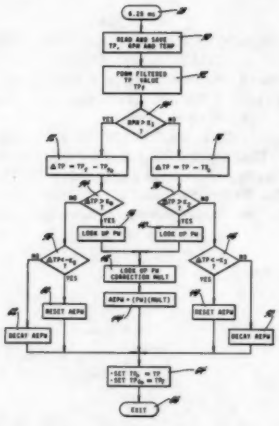


in said cold state, to correct said basic value of the quantity of fuel to an increased value, said method comprising the steps of: (1) detecting a temperature of intake air being supplied to said engine, and (2) correcting said second correction value by said intake air temperature detected in a manner such that said second correction value is corrected to a larger value as said intake air temperature detected is lower.

4,711,218
ACCELERATION ENRICHMENT FUEL CONTROL

Daniel F. Kabasin, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 5, 1987, Ser. No. 11,292
Int. Cl.[4] F02D *41/10*
U.S. Cl. 123—492 3 Claims



1. A fuel supply system for an internal combustion engine having a throttle for controlling its air input, the engine being characterized in that its steady state operating fuel requirements vary from its transient operating fuel requirements, the fuel supply system comprising:
means for measuring engine speed;
means for measuring throttle position;
means for filtering the measured throttle position;
means for sensing an engine transient operating condition representing an engine acceleration enrichment fuel requirement in response to (A) the rate of change in the measured throttle position when the engine speed is less than a predetermined threshold and (B) the rate of change in the filtered throttle position when the engine speed is greater than the predetermined threshold; and
means for supplying acceleration enrichment fuel to the

engine when an engine transient operating condition is sensed, whereby the transient operating fuel requirements of the engine are provided in response to changes in the throttle position over the full operating speed range of the engine.

4,711,219

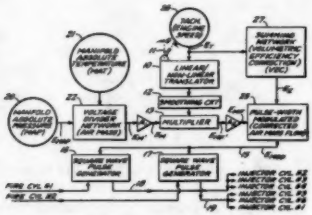
THROTTLE-POSITION SIGNAL GENERATOR FOR AN ELECTRONIC FUEL-INJECTION SYSTEM

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 24, 1986, Ser. No. 889,080

Int. Cl.[4] F02D *41/18*

U.S. Cl. 123—494 **7 Claims**



1. In combination, for use in generation of a fuel-injection control signal which is a non-linear function of throttle position, throttle-tracking means linearly tracking throttle position and producing an analog output voltage which is a linear function of throttle position, an oscillating sawtooth generator producing an output sawtooth voltage of amplitude which is a submultiple of said analog output voltage at full-throttle position, summing means connected to said throttle-tracking means and to said sawtooth generator and producing a summed-voltage output, a multi-step analog switch having an input connected to said summed-voltage output, the number of steps of said switch being equal to said submultiple, said switch having a least an output connection for each of said steps, and a resistance network comprising individual resistors of differing value connected at first ends to the respective outputs of said switch, said network having an output connection in common to the opposite ends of said resistors.

4,711,220

PRESSURE OIL GUIDE DEVICE FOR INJECTION PUMP SHAFT

Ulrich Letsche, Stuttgart, Fed. Rep. of Germany; Wolfgang Rapp, deceased, late of Esslingen, Fed. Rep. of Germany by Gilsea Rapp, heir; Guenther Haefner, Berglen, and Wilhelm Tonhaeuser, Korb, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,539

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440053; Jun. 8, 1985, 3520667

Int. Cl.[4] F02M *59/20*

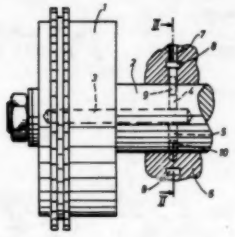
U.S. Cl. 123—502 **17 Claims**

1. A hydraulic oil feeding device comprising:

a pump shaft, a portion of said pump shaft being disposed in an injection pump housing;

a pump feeding means in said injection pump housing;

a passage forming means in said pump shaft for forming a passage between said pump housing feeding means and an injection timing mechanism, said passage forming means including a centrally extending axial bore in said pump shaft and at least one radial bore in said pump shaft connecting said axial bore to said pump housing feeding means, said passage forming means having an interrupted



passage position during an injection process and an open passage position in between injection processes.

4,711,221

FUEL INJECTION PUMP

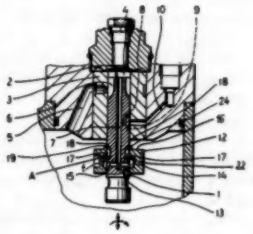
Helmut Laufer, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 30, 1986, Ser. No. 857,660

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516455

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—503 **9 Claims**

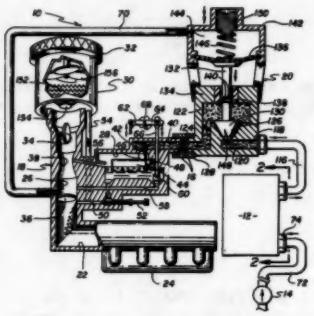


1. A fuel injection pump for internal combustion engines having a reciprocating pump piston defining one end of a pump work chamber and arranged to control an injection quantity by opening a pump work chamber relief conduit, provided in the pump piston for discharge into a jacket face thereof, saqid discharge occuring during a compression stroke of the pump piston via a regulating slide disposed on the pump piston, said slide being axially displaceable thereon to vary the injection quantity, the pump work chamber relief conduit being arranged to discharge into outflow means, said outflow means comprising a relief conduit outlet adjoining said relief conduit, a first recess provided on the pump piston and a second recess provided on the regulating slide, said relief conduit outlet comprising a bore disposed in said pump piston and arranged to exit said jacket face adjacent to said first recess, said recesses being adapted for communication and for selective coincidence therebetween during an opening stroke of said pump piston, said pump piston being arranged to assume a first position wherein the outflow conduit means is fully opened and a second position wherein the outflow conduit means is throttled.

4,711,222
INTERNAL COMBUSTION ENGINE POLLUTANT CONTROL SYSTEM

Kelly R. Rawlings, Big Bear Lake, Calif., assignor to Anti-P, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 729,656, May 2, 1985, abandoned. This application Apr. 23, 1986, Ser. No. 853,425
Int. Cl.[4] F02M *31/12*
U.S. Cl. 123—555 **32 Claims**



1. A pollutant control system for an internal combustion engine including, among other things, a fuel pump, an air intake means, and an intake manifold for passing an air/fuel mixture to a combustion chamber means, the pollutant control system comprising, in combination:

a carburetor having a venturi mixing throat in fluid communication with the air intake means at one end and the intake manifold at the other end, a fuel float chamber, an first fuel passageway from the float chamber to the mixing throat, and a second fuel passageway between the float chamber and the mixing throat:

means for heating air drawn through the air intake means before entering the carburetor mixing throat, the heating means heating the air to a temperature within the range 160° F. to 180° F.;

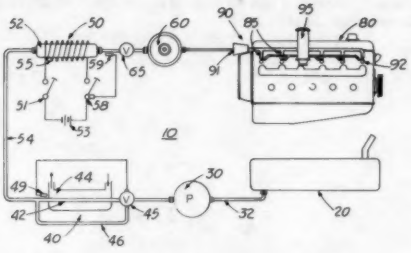
means for heating and vaporizing fuel received from the fuel pump prior to entering the float chamber into a mixture of approximately 30% liquid fuel and approximately 70% vaporized fuel by volume at an outlet end of the heating and vaporizing means, the temperature of the fuel mixture at the outlet of the heating and vaporizing means being within the range of 115° F. to 125° F.; and

means for controlling the flow of the mixture of liquid and vaporized fuel from the heating and vaporizing means being connected to ported vacuum pressure in the carburetor and responsive to that pressure to increase the flow of the mixture of liquid and vaporized fuel when the pressure decreases, and decrease the flow of the mixture of liquid and vaporized fuel when the pressure increases, whereby during an engine idle condition the float chamber will remain substantially full of liquid fuel and the liquid fuel escaping therefrom through the first fuel passageway is replenished with fuel heated by the heating and vaporizing means, and as the engine speed is increased the flow controlling means will cause the liquid fuel level to drop within the float chamber sufficiently to permit vaporized fuel to pass through the second fuel passageway into the mixing throat for mixing with heated air drawn through the air intake means.

4,711,223
ALCOHOL FUEL CONVERSION APPARATUS

Bruce I. Carroll, 6137 Denton, Boise, Id. 83704

Continuation-in-part of Ser. No. 297,215, Aug. 28, 1981, Pat. No. 4,635,608. This application Aug. 18, 1986, Ser. No. 897,791
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[4] F02M *31/02*
U.S. Cl. 123—557 **12 Claims**



1. Alcohol fuel conversion apparatus for internal combustion engines comprising:

fuel storage means for containing an alcohol fuel;

primary heat exchange means in fluid communication with said fuel storage means for transferring heat to pressurized alcohol contained within said heat exchange means;

a heat source for heating said primary heat exchange means;

pressure relief valve means in closed fluid communication with said primary heat exchange means for releasing heated pressurized alcohol into an expansion chamber;

converter means including said expansion chamber in fluid communication with said pressure relief valve means for receiving the heated pressurized alcohol and for the vaporization of the alcohol;

fuel injection means in fluid communication with said converter means for injecting vaporized alcohol into the cylinders of an internal combustion engine for mixing with air within the cylinders for proper combustion; and

pump means for pressurized pumping of alcohol from said 23 fuel storage means to said primary heat exchanger means, converter means, fuel injector means, and to the engine.

4,711,224
CHECK VALVE IN AUXILIARY VACUUM SYSTEM

Dennis C. Eckhardt, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1986, Ser. No. 902,663
Int. Cl.[4] F02B *25/06*
U.S. Cl. 123—572 **3 Claims**

1. In an auxiliary vacuum system of an automotive vehicle having a vacuum operated device and an internal combustion engine with a crankcase scavenged at a predetermined airflow rate by a crankcase ventilation system of said engine,

said auxiliary vacuum system including

a rotary vane type vacuum pump having an intake and an exhaust,

a first duct between said vacuum pump intake and said vacuum operated device whereby air is exhausted from said vacuum operated device at a normal airflow rate less than said predetermined scavenge airflow rate, and

a second duct between said vacuum pump exhaust and said engine crankcase whereby air is discharged from said vacuum pump into said crankcase,

in said auxiliary vacuum system, a check valve comprising:

means defining a valve chamber connected to said first duct and to said vacuum pump intake,

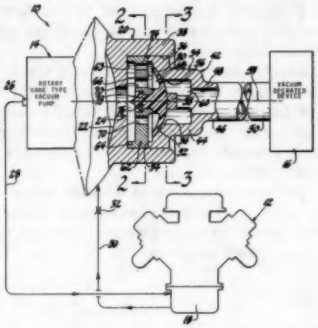
means defining an inlet port between said valve chamber and said first duct,

means defining an outlet port between said valve chamber and said vacuum pump intake,

means defining a control orifice between said valve chamber and said vacuum pump intake having a flow area substantially less than the flow area of said outlet port and predetermined to limit airflow therethrough to less than said predetermined scavenge airflow rate,

a valve element,

means mounting said valve element in said valve chamber for movement between a closed position covering said inlet port to prevent backflow of air to said vacuum operated device and a normal open position permitting airflow to said vacuum pump intake through both said control orifice said outlet port and a control open position closing



said outlet port and limiting airflow to said vacuum pump to only said control orifice, and

means biasing said valve element to said closed position,

a normal pressure difference across said valve element corresponding to operation of said vacuum pump with the integrity of said vacuum system intact being operative to move said valve element from said closed to said normal open position and a larger pressure difference across said valve element corresponding to operation of said vacuum pump with the integrity of said auxiliary vacuum system breached being operative to move said valve element to said control open position thereby to limit the flow rate of air through said vacuum pump to less than said predetermined scavenge airflow rate.

4,711,225

CONNECTING PIECE BETWEEN THE CARBURETOR AND THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

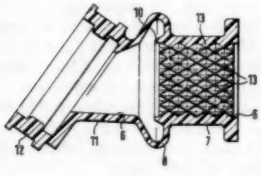
Hans Holderle, Freiberg; Jürgen Wolf, Stuttgart; Horst Eckhart, Auenwald, and Werner Vonderau, Waldrems, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,670

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606708

Int. Cl.[4] F02M *29/00*

U.S. Cl. 123—590 **11 Claims**



1. A connecting piece for connecting a carburetor to the combustion chamber of the engine of a power-driven tool such as a motor-driven chain saw or the like, the connecting piece conducting the air-fuel mixture in a primary flow direction from the carburetor to the combustion chamber, the connecting piece comprising: an annular conduit-like member defining a longitudinal axis and having an inner wall surface; and, a thick plurality of protrusions formed over a substantial portion of said inner wall surface, said protrusions being disposed one behind the other as seen in said flow direction in a manner so as to prevent the formation of channels in a direction parallel to said axis.

4,711,226

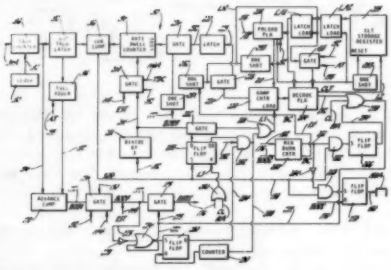
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Michael A. Neuhalfen, Galveston; Frank E. Ridoux, Kokomo, and John S. Edenborough, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1987, Ser. No. 5,652

Int. Cl.[4] F02P *9/00*

U.S. Cl. 123—609 **3 Claims**



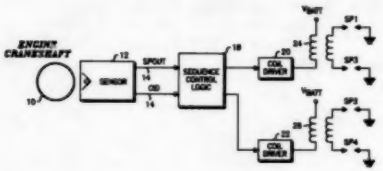
1. An ignition system for an internal combustion engine comprising, an ignition coil having a primary winding and a secondary winding, a spark plug connected to said secondary winding, a means for energizing and deenergizing said primary winding comprising a semiconductor switching means connected to said primary winding that is biased conductive and nonconductive, said semiconductor switching means being biased conductive by a start of dwell signal SOD and nonconductive by an end of dwell signal EOD, said signals being developed in synchronism with operation of said engine, current sensing means for sensing primary winding current, means coupled to said current sensing means for biasing said semiconductor switching means to a current limiting mode when the magnitude of the primary current attains a current limit value, means for developing a signal RT that is a function of the time period between the occurrence of the SOD signal and the point in time where primary current reaches said current limit value, means for controlling the time period between the occurrence of the EOD signal and the SOD signal as a function of the magnitude of said RT signal, a control circuit having an output connected to said semiconductor switching means for at times developing said EOD signal to cause said semiconductor means to be biased nonconductive, means for developing a spark timing signal and for applying said signal to the input of said control circuit, said control circuit including means operative in a first mode for developing said EOD signal substantially when said spark timing signal occurs or in a second mode wherein said EOD signal is developed at a time delayed from the occurrence of said spark timing signal, means for developing a current limit signal when primary winding current attains said current limit value, means for developing a minimum ramp time signal that is developed whenever the time period that the primary winding is energized exceeds a predetermined value, and means for causing said control circuit to operate in said first mode when either said ramp time signal or said current limit signal occurs before the occurrence of said spark timing

signal and in said second mode if said signals occur after the occurrence of said spark timing signal, said system when operating in said second mode causing said EOD signal to be developed substantially at the first to occur of said current limit and minimum ramp time signals.

4,711,227
APPARATUS AND METHOD FOR ELECTRONIC IGNITION CONTROL

Edward Li, Roselle; Leonard Foss, Lombard, and David Cousins, Carol Stream, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1986, Ser. No. 896,981
Int. Cl.[4] F02P 5/145, 11/00
U.S. Cl. 123—643 **31 Claims**



1. In an ignition system employing a crankshaft and spark plugs, wherein at least one identifier signal is generated which is indicative of a crankshaft angle position and which may be used to identify a spark plug firing sequence, a method for selecting ones of the spark plugs to fire, comprising the steps of:

(a) determining whether or not a transition in the identifier signal has occurred;

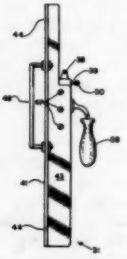
(b) generating, in response to the absence of the identifier signal, a replacement signal independent of the crankshaft angle position; and

(c) selecting at least one of the spark plugs to fire from said generating replacement signal.

4,711,228
VERTICAL CROSS BOW AND REMOVABLE STOCK ASSEMBLY THEREFOR

Noah N. Gillespie, 58 Dobbins Rd., Waverly, Ohio 45690

Filed Jan. 12, 1987, Ser. No. 2,567
Int. Cl.[4] F41B 5/00
U.S. Cl. 124—25 **4 Claims**



1. A crossbow comprising:

(a) a compound bow comprised of a rigid handle having an arrow rest disposed upon one side thereof, paired spring-like metal limbs attached to the extremities of the handle, paired pulley wheels associated with the free distal extremities of said limbs, and a bowstring having its extremities anchored to the handle and extending to engagement with said pulley wheels whereby the distance between opposed pulley wheels is traversed twice in crossing relationship within the space embraced by the limbs, and traversed once in an outer wrap adapted to be drawn rearwardly away from the bow, and

(b) a stock assembly adapted to be removably attached to said handle to dispose said bow vertically, said stock assembly comprising:

(1) an elongated rigid stock of substantially monolithic construction having a rearwardly disposed shoulder portion, and a forearm portion extending continuously from said shoulder portion to a forward extremity, said stock having opposed first and second side surfaces,

(2) a trigger mechanism positioned at the junction of said shoulder and forearm portions,

(3) a gripping handle attached to said first side surface within said forearm portion and extending laterally away from said side surface,

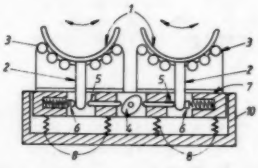
(4) attachment means for removably attaching the stock assembly to the handle of the bow, and comprised of a vertically disposed sideplate bolted to said second side surface and an end plate perpendicularly emergent from said sideplate and bolted to the forward extremity of said stock, and

(5) guide means associated with the first side surface for constraining the path of movement of the outer wrap of the bowstring to the path it would have in the absence of said stock assembly.

4,711,229
MASSAGING APPARATUS FOR THE LOWER EXTREMITIES OF THE BODY

Gerhard G. Hengl, Jueptnergasse 17/1/14, A-1220 Vienna, Austria

Filed May 7, 1986, Ser. No. 860,505
Int. Cl.[4] A61H 7/00
U.S. Cl. 128—49 **5 Claims**

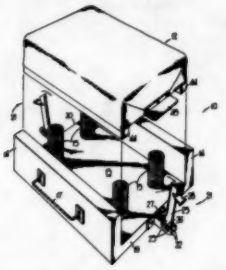


1. Apparatus for massaging the legs of a user, comprising a pair of arcuate massage components, each of said pair being formed as an axial section of an open-ended cylinder and having a concave surface adapted to receive a leg of a user and an oppositely disposed convex surface facing inwardly of said apparatus, a casing, a lever integrally mounted on said convex surface of each of said pair of massage components and having an end extending into said casing, first cam means adapted to act on said lever ends for displacing said levers along and opposite a first direction substantially perpendicular to the extent of said levers, motor means for driving said first cam means, and an arcuate array of cylindrical bearings individual to each of said pair of massage components and mounted on said casing, each said array of cylindrical bearings extending parallel to the axis of and contacting said convex surface of its corresponding massage component, whereby displacement of said levers along and opposite said first direction is translated into pivotal displacement of said pair of massage components about their respective axes.

4,711,230
CHIROPRACTIC ADJUSTMENT DEVICE

Michael Berke, and Matthew Rosman, both of 2070 Hidden Glen Dr., Marietta, Ga. 30067

Filed Jun. 2, 1986, Ser. No. 869,734
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—69 8 Claims

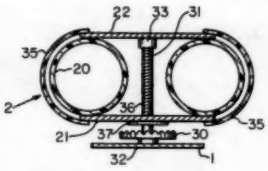


5. A chiropractic adjustment device comprising a base, a pair of catches pivotably mounted to opposite sides of said base, a set of springs mounted atop said base; a headrest mounted upon said set of springs; a pair of latch bars mounted to opposite sides of said headrest in engagement with said pair of catches, and wherein each of said catches includes an elongated bar spring biased against one of said latch bars that has a linear series of teeth configured to catch and hold said latch bars at a plurality of headrest positions under bias of said set of springs.

4,711,231
IMPLANTABLE PROSTHESIS SYSTEM

Aaron N. Finegold, 136 Beechwood La., Pittsburgh, Pa. 15206, and Maurice E. Taylor, Monroeville, Pa., assignors to Aaron N. Finegold, Pittsburgh, Pa.

Filed Nov. 3, 1986, Ser. No. 926,186
Int. Cl.[4] A61F 2/26
U.S. Cl. 128—79 20 Claims

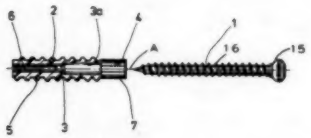


1. A surgically implantable prosthesis system including at least one flexible inflatable member, an imperforate housing, a flexible combination reservoir and pump means located within said housing for storing liquid when said inflatable member is deflated and for pumping liquid into said inflatable member to inflate said inflatable member, a flexible connecting means extending out of said housing from said combination reservoir and pump means to said inflatable member for permitting the passage of liquid between said combination reservoir and pump means and said inflatable member, a battery operated power means located within said housing, drive means located within said housing operatively connecting said power means to said combination reservoir and pump means to collapse said combination reservoir and pump means to force liquid out of said combination reservoir and pump means through said connecting means into said inflatable member and to expand said combination reservoir and pump means to receive liquid from said inflatable member, a battery located within said housing, an electric circuit located within said housing connecting said battery to said power means and a pair of switches located outside of said housing and connected in said electric circuit between said battery and said power means to operate said power means, whereby closing one of said switches operates said power means and said drive means to collapse said combination reservoir and pump means to force liquid out of said combination reservoir and pump means into said inflatable member and closing the other of said switches operates said power means and said drive means to expand said combination reservoir and pump means so that liquid flows from said inflatable member into said combination reservoir and pump means.

4,711,232
BONE FASTENER AND METHOD OF INSTALLING SAME

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, and Wolfgang Kramer, Oberjettingen, both of Fed. Rep. of Germany, assignors to Artur Fischer, Waldachtal, Fed. Rep. of Germany

Filed Dec. 23, 1985, Ser. No. 813,224
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524946
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 YF 4 Claims



1. In a combination comprising a fastener and a threaded bore in a bone in which the fastener is anchored, the fastener being utilizable with hard and soft bones and comprising:

a screw having a substantially cylindrical outer surface formed with a helical srewthread, the screw having at its screwthread a thread diameter and between the turns of the thread at the surface a root diameter smaller than the thread diameter; and

an anchor sleeve of a resilient synthetic resin, defining and extending along an axis, normally fitted in the bore, of an outside diameter corresonding generally to the diameter of the bore, and having

an outer end formed with an outwardly open polygonal-section recess,

an inner end formed with an inwardly open and transversely throughgoing slot,

an outer end portion of an inside diameter greater than the root diameter but smaller than the thread diameter,

an inner end portion of an inside diameter smaller than the root diameter, and

an external helicoidal screwthread extending about two-thirds of the length of the sleeve from its inner end toward its outer end,

the screwthread of the sleeve having a rounded outer edge and the outer surface being rounded between the turns thereof.

4,711,233
METHOD AND APPARATUS FOR CEMENTING AN ACETABULAR CUP TO AN ACETABULUM

Byron L. Brown, 2315 Hendricks, Fort Smith, Ark. 72903

Filed Jun. 26, 1985, Ser. No. 748,856
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 VP 33 Claims

1. A method of attaching an acetabular cup to an acetabulum comprising the steps of:

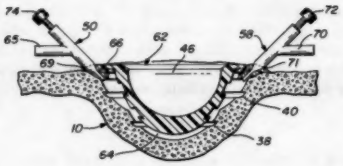
a. preparing said acetabulum for receiving said cup,

b. cementing a retaining ring to said acetabulum in a substantially air tight placement such that a support for said cup

is formed to hold said cup in spaced relationship with said acetabulum,

c. placing said cup in said acetabulum supported by said ring,

d. rigidly fastening said ring and said cup to said acetabulum,



e. filling said space between said cup and said acetabulum with flowable cement under pressure, and

f. maintaining said pressure until said flowable cement hardens thereby retaining said cup in said acetabulum in a fixed relationship.

4,711,234

BIO-COMPATIBLE RETENTION PIN, AND A PROSTHESIS INCLUDING SUCH A PIN

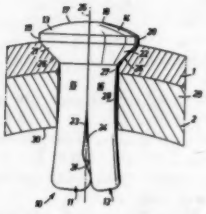
Michel Vives, Eynes, and Bernard Buttazzoni, Marseilles, both of France, assignors to Societe Europeen de Propulsion, Suresnes, France

Filed Feb. 10, 1987, Ser. No. 14,375

Claims priority, application France, Feb. 11, 1986, 86 01840

Int. Cl.[4] A61F *5/04, 2/28;* **F16B** *15/00*

U.S. Cl. 128—92 YF **6 Claims**



1. A retention pin for fixing a support plate or other prosthesis onto bone tissue, e.g. onto the cortical wall of a bone, said pin being made of a material which is bio-compatible with human tissue and comprising two half-pins each having a respective half-head for bearing against the plate, and a retention shank of generally semi-cylindrical outline, said half-pins being generally symmetrical to each other about a radial separation plane passing at least in part along the pin axis and extending up to the inside face of each half-head from which the respective retention shanks project, each shank being sufficiently long to pass through a wall of bone and to project therebeyond by a distance which is not less than the diameter of the fixing hole through said wall of bone, each shank also including locking means in the vicinity of the free end of the pin suitable for urging the two half-pins apart from each other so as to press them resiliently over at least a portion of their length against the inside wall of the fixing hole.

4,711,235

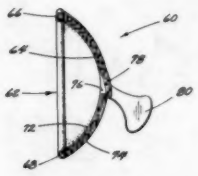
INTRAVAGINAL DEVICE

Robert E. Willis, 6606 N. Saginaw, Flint, Mich. 48505

Continuation of Ser. No. 658,279, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 452,449, Dec. 23, 1982, abandoned, which is a continuation of Ser. No. 215,624, Dec. 12, 1980, abandoned. This application Aug. 13, 1986, Ser. No. 896,316

Int. Cl.[4] A61F *5/46*

U.S. Cl. 128—130 **8 Claims**



1. An intravaginal device comprising:

a sheet member of flexible, fluid-impermeable material;

a normally closed flap valve formed in said sheet member, said flap valve having an extension for actuating said flap valve between said normally closed position and an open position; and

a supporting ring formed of a first resilient material attached to a border of said sheet material to force said sheet material into a cup-shape with four sides, one pair of opposing ones of said sides including a core formed of a second resilient material defining said ring sides as inwardly bent in a central area thereof, and another pair of said sides opposite one another formed entirely of said first resilient material, one said side being outwardly rounded and the other said side having an inwardly rounded configuration.

4,711,236

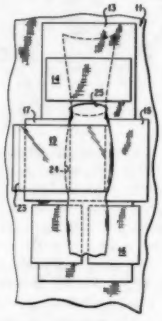
SURGICAL DRAPE

Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

Continuation-in-part of Ser. No. 395,803, Jul. 6, 1982, Pat. No. 4,524,767. This application Feb. 25, 1985, Ser. No. 698,162

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—132 D **6 Claims**



1. A surgical drape comprising a main drape and at least one absorbent sheet overlying and secured to said main drape, a common opening extending through the main drape and said absorbent sheet to receive a human limb extended therethrough whereby an operable portion of said limb lies over the absorbent sheet, a plurality of sheets of liquid-absorbent toweling secured to the absorbent sheet and surrounding said opening, a sterile incise drape comprising a transparent bacterioci-

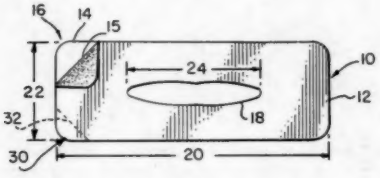
dal top sheet, an adhesive coating on the under surface of the top sheet, a protective bottom sheet adhesively joined to the top sheet face-to-face, a detachable flap on one edge of the top sheet adapting said incise drape to be secured to any site on the main drape, said top and bottom sheets of said incise drape being separable to expose the adhesive on it's under surface, and a line of perforations dividing said transparent top sheet from the attached flap to permit complete separation of the transparent top sheet from the said flap, whereupon the freed sterile incise top sheet may be wrapped around and adhesively secured to the operable portion of the limb to completely and sterily enclose said operable portion.

4,711,237

PROTECTIVE SANITARY BARRIER FOR CPR DOLL

June Kaiser, 333 E. Ontario 813 B, Chicago, Ill. 60611

Filed Jan. 22, 1986, Ser. No. 821,462
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—136 **7 Claims**



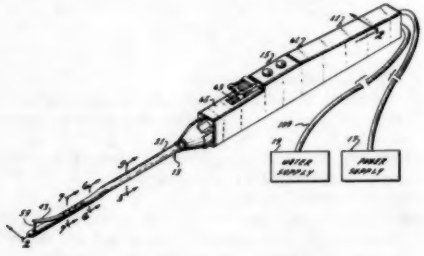
1. A protective barrier adapted to be adhered onto the lips and lip region proximate thereto defining the oral opening of a CPR doll made of rubber-like plastic the barrier comprising a protective sheet of material substantially impervious to germs and bacteria sized to completely cover the lips and lip region of said CPR doll, said protective sheet having a central opening corresponding to the oral opening of said CPR doll and having an adhesive covering substantially all of one surface thereof; said adhesive being compatible with said rubber-like plastic of said CPR doll, being easily releasable from said CPR doll, and being removable therefrom such that any residue remaining on said CPR doll is easiy removable therefrom; said protective sheet having a permanently affixed backing tab at a peripheral location on said one surface in order to facilitate the removal of said protective sheet from said CPR doll.

4,711,238

MENISCAL CUTTING DEVICE

Frank W. Cunningham, 1801 Via Estudillo, Palos Verdes Estates, Calif. 90274

Filed Mar. 14, 1985, Ser. No. 712,378
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.14 **19 Claims**



1. An electrosurgical device comprising:

an elongated probe having a distal end portion for insertion into an incision;

first and second electrode supports;

means for mounting the electrode supports on the probe, said first and second electrode supports being movable relative to each other to vary the spacing between the first nd second electrode supports;

a variable length flexible electrode for electrosurgery extending between the first and second electrode supports so that the length of the electrode can be varied by varying the spacing between the first and second electrode supports;

means for controlling the spacing between the first and second electrode supports to thereby control the length of the electrode;

means couplable to an electrical power supply for supplying electrical energy to the electrode for electrosurgery; and

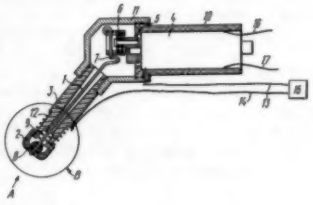
the first electrode support includes a resilient leaf spring, said mounting means couples the leaf spring to said probe so that the leaf spring has a free end which is resiliently movable relative to said second electrode support, and said electrode is coupled to said leaf spring adjacent said free end whereby the leaf spring can tension the electrode.

4,711,239

ELECTROSURGICAL INSTRUMENT

Oleg A. Sorochenko, ulitsa Chaikovskogo, 33b, kv. 105, and Igor F. Kondratiev, pereulok Jurievsky, 9, both of Kharkov, U.S.S.R.

PCT No. PCT/SU85/00009, § 371 Date Aug. 26, 1986, § 102(e) Date Aug. 26, 1986, PCT Pub. No. WO86/04226, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 25, 1985, Ser. No. 915,248
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.14 **3 Claims**



1. An electrosurgical instrument, comprising:

a cylinder-shaped body having an interior;

a passive outer electrode mounted to an end of the cylinder-shaped body in coaxial relation therewith and made as a nut thread-joined with the body;

an active central electrode shaped as a needle located in the interior of the cylinder-shaped body coaxially with the outer electrode and traversable with respect to the outer electrode;

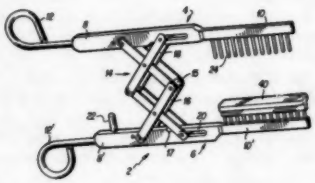
means for cleaning carbon deposits from said central electrode, said means including an insert made of an insulating material and accommodated inside the outer electrode, the insert being made as a spring-actuated ball having a central hole through which the central electrode is passed, the ball hole having an axis and a diameter equal to the diameter of the central electrode; and

a power actuator rigidly coupled to the central electrode to impart reciprocating motion to the central elctrode along the axis of the ball hole.

4,711,240
SURGICAL DISSECTOR

Benad Goldwasser, Rochester, Minn., and Culley Carson, Durham, N.C., assignors to Duke University Patents Foundation, Durham, N.C.

Filed May 15, 1986, Ser. No. 863,446
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—319 9 Claims



1. A surgical dissector for crushing friable organ tissue, comprising:

first and second parallel arms, each having an essentially planar surface;

means for moving said first and second arms toward and away from one another while maintaining said arms parallel to one another; and

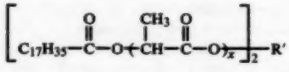
a plurality of mutually parallel and cylindrical teeth mounted on and projecting from said planar surface of each of said first and second arms, said teeth on each of said arms projecting from said arm in a direction transverse to a length of said arm and forming an array extending along the length of said arm, all of said teeth having rounded distal ends and being positioned on said arms so as to be mutually interdigitated when said arms are moved toward one another to a closed position, wherein said teeth are positioned on said arms such that spaces are provided between said interdigitated teeth.

4,711,241
SURGICAL FILAMENT COATING

Leonard T. Lehmann, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 5, 1986, Ser. No. 903,799
Int. Cl.[4] A61L 17/00
U.S. Cl. 128—335.5 1 Claim

1. A surgical filament comprising in combination a bioabsorbable suture or ligature manufactured from a copolymer containing at least one glycolic acid ester and trimethylene carbonate linkage, and having on the surface thereof a coating comprising a compound of the formula:



(I)

wherein x is at least 2 and R′ is an alkaline-earth metal ion.

4,711,242
CONTROL SYSTEM FOR KNEE JOINT

Jerrold S. Petrofsky, Beavercreek, Ohio, assignor to Wright State University, Dayton, Ohio

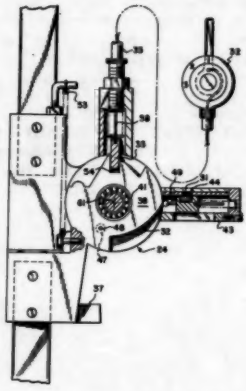
Filed Feb. 18, 1986, Ser. No. 829,722
Int. Cl.[4] A61N 1/32
U.S. Cl. 128—419 R 8 Claims

1. Apparatus for stimulated control of a knee joint in a paralyzed human leg comprising:

a brace for said leg; said brace being provided with an overcenter hinge which opens when said knee joint flexes and which tends to lock under a vertically applied load if opened less than a first predetermined angle when said load is applied,

a sensor for sensing the angle of opening of said hinge and generating a sensing signal indicative thereof,

control means connected for receiving said sensing signal, generating a reference signal representing a desired value for said angle of opening, and generating a command signal related to the difference between said sensing and



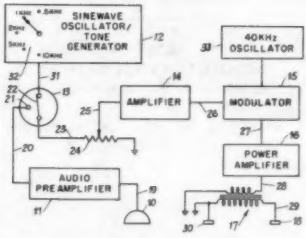
said reference signal; said command signal being nonresponsive to changes in said sensing signal when said angle of opening is less than a second predetermined angle which is greater than zero and not greater than said first predetermined angle, and

stimulation means responsive to said command signal for stimulating muscles of said leg connected for causing extension of said knee joint.

4,711,243
CORTICAL HEARING AID

Curtiss R. Schafer, Norfolk, Conn., assignor to Cortronix, Inc., Newtown, Conn.

Filed Jul. 28, 1986, Ser. No. 890,027
Int. Cl.[4] A61N 1/30
U.S. Cl. 128—420.5 18 Claims



1. A hearing aid comprising:

a microphone means (10) for detecting sound and producing an audio frequency signal representative of the detected sound;

a sinewave oscillator/tone generator means (12) for producing an audio frequency test signal;

variable resistance means (24);

switch means (13) operatively connected for selectively coupling said audio frequency signal and said audio frequency test signal to said variable resistance means;

amplifier means (14) operatively coupled to said varible

resistance means for amplifying said audio frequency signal and said audio frequency test signal;

amplitude modulator means (15) including an unbalanced bridge rectifier (34) operatively coupled to said amplifier means, and including a carrier frequency generator means (33) for producing a carrier frequency in the range of about 40 KHz, and including a first transformer means (35) operatively coupled to said carrier frequency generator means and to said unbalanced bridge rectifier for producing a composite signal;

power amplifier means (16) operatively coupled to said amplitude modulator means and being responsive to said composite signal for producing an amplifier composite signal;

second transformer means (17) operatively coupled to said power amplifier and being responsive to said composite signal for producing a stepped-up voltage signal representative of said amplified composite signal;

probe means (18, 30) responsive to said voltage signal for producing a probe signal representative of said voltage signal and for impressing said probe signal on the person of the user.

4,711,244

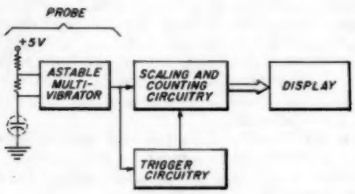
DIGITAL MOISTURE DERMATOMETER

David J. Kuzara, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 331,729, Dec. 17, 1981, abandoned. This application Sep. 12, 1985, Ser. No. 775,939

Int. Cl.[4] A61B 5/00

U.S. Cl. 128—632 **5 Claims**



1. An improved instrument of the type for making random, on demand measurements on the stratum corneum of the skin, said instrument having a stray field capacitance transducer for making said measurements, the improvement which comprises

(a) an oscillator circuit, comprising an oscillator of predetermined frequency and said stray field capacitance transducer, whereby said oscillator frequency varies in accordance with the capacitance measurement of said transducer,

(b) a readout means adapted to receive and display said oscillator frequency, and

(c) a trigger means coupled to said oscillator circuit and said readout means for obtaining a reading on said readout means, said trigger means comprising means to provide a fixed frequency, means to compare said fixed frequency to said oscillator frequency, and means to enable said readout means when said oscillator frequency exceeds said fixed frequency.

4,711,245

SENSOR FOR COMPONENTS OF A LIQUID MIXTURE

Irving J. Higgins, Bedford; Hugh A. O. Hill, Oxford, and Elliot V. Plotkin, Bedford, all of United Kingdom, assignors to Genetics International, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 436,106, Oct. 22, 1982, Pat. No. 4,545,382. This application May 7, 1984, Ser. No. 607,699

Claims priority, application United Kingdom, May 5, 1983, 8312259; Feb. 29, 1984, 8405262; Feb. 29, 1984, 8405263; Oct. 23, 1984, 813034

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] A61B 5/00

U.S. Cl. 128—635 **27 Claims**

1. An electrode sensor system for sensing the presence of at least one selected component of a mixture of components, said sensor system comprising:

(a) at least two electrically conducting means insulated from each other, each said conducting means having an electrically conductive surface for transferring electrical signals, each said surface being adapted to be in electrical contact with said mixture,

(b) an enzyme, the catalytic activity of said enzyme being indicative of the presence of said component,

(c) a mediator compound which transfers electrons between said enzyme and one said conductive surface when said enzyme is catalytically active, said mediator being an organometallic compound which comprises at least two organic rings, each of which is characterised by at least two double bonds that are conjugated and a metal atom in electron-sharing contact with each of said rings, and

(d) means for measuring current resulting from said electron transfer at said one conductive surface, said measuring means being electrically connected to each of said electrically conducting means.

4,711,246

FIBER OPTIC COUPLED PRESSURE TRANSDUCER USING SINGLE FIBER AND METHOD OF FABRICATION

Richard Alderson, Phoenix, Ariz., assignor to Fiberoptic Sensor Technologies, Inc., Ann Arbor, Mich.

Filed Sep. 2, 1986, Ser. No. 902,666

Int. Cl.[4] A61B 5/02

U.S. Cl. 128—667 **10 Claims**

1. A fiber optic pressure transducer comprising:

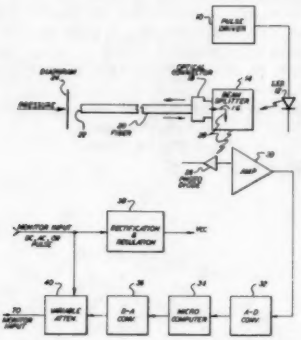
(a) light generating means;

(b) an elongated, optical fiber having a first terminal end positioned to receive light from said generating means and a second terminal end to which said light is carried through said fiber;

(c) a deformable member having a first, light reflecting surface positioned in opposed, spaced relation to said second terminal end and movable with respect thereto in accordance with the pressure exerted on the opposite side of said deformable member from first surface;

(d) a layer of light absorptive material interposed between said second terminal end and said light reflecting surface and having a plurality of openings therethrough, whereby a portion of said light carried through said fiber to said second terminal end passes through said openings and another portion is intercepted by said layer, and a portion

of the light passing through said openings and reflected by said reflecting surface passes back through said openings and is carried back through said fiber and another portion is intercepted by said layer; and



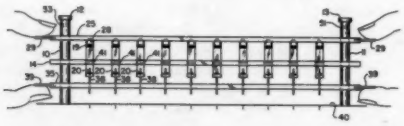
(e) means for generating an electrical signal commensurate with the intensity of light carried back through said fiber, said intensity being a function of the distance between said second terminal end of said fiber and said reflecting surface and thereby of said pressure exerted on said opposite side of said deformable member.

4,711,247

ALLERGY TESTING METHOD AND APPARATUS

Henry Fishman, 5173 Linnean Ter. NW., Washington, D.C. 20008

Filed Apr. 18, 1986, Ser. No. 853,710
Int. Cl.[4] A61B *15/00, 17/20*
U.S. Cl. 128—743 **24 Claims**



13. A method of testing a patient for a plurality of allergies at substantially the same time, comprising:

providing a plurality of allergen sources and a plurality of spaced apart movable pricking means for pricking the skin of a patient when said pricking means are moved from an inactive position out of contact with the skin of the patient, to an active position in contact with the skin of the patient, each of said pricking means being associated with a respective one of said allergen sources;

said allergen sources and pricking means being mounted and supported on a carrier means, an actuating means being movably coupled to said carrier means for relative movement therebetween;

placing at least a portion of said carrier means on the skin of a patient and placing said pricking means adjacent to the skin of the patient in said inactive position out of contact with said skin; and

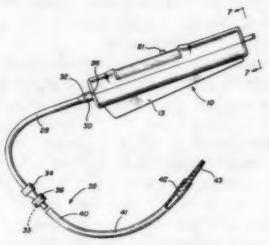
moving said actuating means relative to at least a portion of said carrier means for substantially simultaneously moving each of said pricking means from said inactive position to said active position thereof to prick the skin of the patient and for applying an allergen from respective allergen sources to the skin of the patient via said associated pricking means.

4,711,248

PHYSIOLOGICAL PRESSURE MONITOR

Robert R. Steuer, Salt Lake City, Utah, and David H. Harris, Boise, Id., assignors to Biokinetics, Inc., Salt Lake City, Utah

Filed Dec. 1, 1983, Ser. No. 556,912
Int. Cl.[4] A61B *5/00, 5/04*
U.S. Cl. 128—748 **7 Claims**



1. A physiological pressure device for continuously monitoring a muscle compartment of a patient, said device comprising:

a portable housing including means for attaching said housing in proximity to a muscle bundle associated with the muscle compartment of the patient being monitored;

an elongated implantable catheter having one end terminating in a probe exhibiting wicking action, said probe adapted to be implanted within the muscle compartment of the patient;

pressure sensing means disposed in said portable housing means and connected to the other end of said catheter means for sensing pressure in said muscle compartment by way of said implanted probe;

means within said housing and responsive to said pressure sensing signal for providing a first information signal indicative of the pressure inside said muscle compartment;

stimulating means including electrode means mounted on the skin of the patient adjacent said muscle compartment for controllable delivering a shock to the exterior skin in the vicinity of the muscle compartment being monitored;

pick-up means contacting the exterior skin adjacent the muscle compartment of the patient for sensing the action potential developed when said stimulating means is delivering a shock;

means within said housing and responsive to the output of said pick-up means for providing a second information signal indicative of the amplitude of the action potential of said muscle bundle;

means within said housing and responsive to said second information signal for providing a third information signal indicative to the nerve conduction velocity through said muscle bundle;

display means for displaying said information signals in eye-readable form; and

means for selectively passing said information signals to said display means.

4,711,249

CIRCUMFERENTIAL MEMBRANE, FLUID COUPLED CATHETER

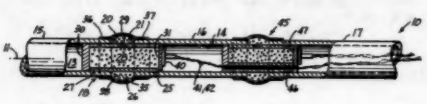
Albert E. Brooks, 1730 Ocean Oaks, Carpinteria, Calif. 93013

Filed Jul. 23, 1986, Ser. No. 889,103
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **6 Claims**

1. A fully circumferentially responsive medical catheter having a longitudinal axis, and comprising:

a longitudinally elongated circularly sectioned support tube for insertion into a body region to be investigted, said support tube having an internal lumen with an internal wall, and being divided into a plurality of lengths, each length having an end;

a rigid insert inserted into the lumen of two adjacent lengths, making a sealing fit therewith, portions of said lengths overlapping said insert with their ends spaced apart from one another to leave a spacing between them, said insert having a cylindrical outer wall and an internal chamber, there being a port through said wall interconnecting said chamber and closing said spacing, and a closure at each end of said chamber closing the same, one closure being rigid and the other closure being elastically flexible to respond to pressure changes in the chamber;



a flexible membrane extending entirely around said spacing and overlapping said ends of said lengths, whereby to close said spacing, leaving the spacing as a continuous peripheral cavity and retain a liquid within said spacing and chamber, said spacing and chamber thereby containing said liquid as an encapsulation inside said membrane; insert and closures;

sensor means responsive to flexure of the flexible closure and thereby to pressure in said chamber; and

connector means connected to said sensor means adapted to connect the sensor means to means for providing a signal proportional to pressure in said chamber.

4,711,250

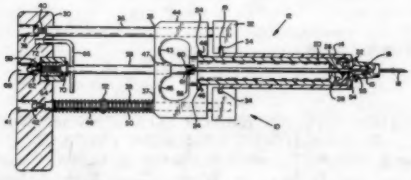
HAND-HELD MEDICAL SYRINGE ACTUATOR DEVICE

James H. Gilbaugh, Jr., 2902 SW. Canterbury, Portland, Oreg. 97201, and Charles B. Willock, 16222 SE. Oatfield Rd., Milwaukie, Oreg. 97222

Filed Sep. 9, 1986, Ser. No. 905,788

Int. Cl.[4] A61M *5/00*

U.S. Cl. 128—765 **11 Claims**



1. A syringe-type medical device for holding a syringe of the type having a syringe cylinder which slidably receives a plunger, the device comprising:

a frame;

the frame including means for removably holding the syringe cylinder;

a movable finger-engaging member slidable on the frame from an initial position to a retracted position, the movable finger-engaging member having means for removably holding the plunger;

a movable valve stem mounted on the frame;

a spring urging said valve stem in a predetermined direction for valve seating purposes; and

finger engaging means for applying a retracting and unseating force to the valve stem.

4,711,251

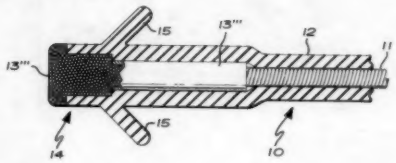
BODY IMPLANTABLE LEAD

Kenneth B. Stokes, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 182,963, Sep. 2, 1980, abandoned. This application Mar. 31, 1983, Ser. No. 480,913

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—784 **3 Claims**



1. In a body implantable lead for the delivery of stimulation energy to a desired body site of the type having at least one electrode carried by the lead, said electrode being adapted for positioning at least adjacent to said desired body site, the improvement wherein said lead further comprises drug dispensing means carried by said lead and includes means for storing a drug to be dispensed while allowing dispensing of said drug at least adjacent the distal end of said lead to counter undesirable interactions between said lead and the body and wherein said drug is compounded into a solid material, said solid material being carried by said lead adjacent said distal end.

4,711,252

METHOD AND APPARATUS FOR MOUNTING CONCAVES

Richard P. Bernhardt, Leola, and Robert L. Bowman, Ephrata, both of Pa., assignors to New Holland Inc., New Holland, Pa.

Filed Apr. 7, 1986, Ser. No. 848,507

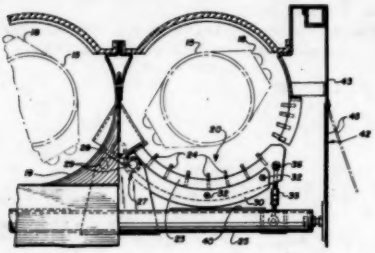
Int. Cl.[4] A01F *12/28*

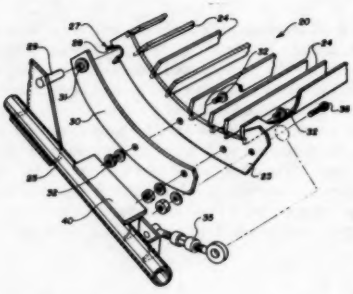
U.S. Cl. 130—27 S **14 Claims**

1. In an axial flow combine harvester having a mobile frame supporting a pair of transversely spaced side sheet and a threshing and separating rotor supported by said frame and extending in a generally longitudinally extending direction, said rotor being cooperable with a concave peripherally positioned relative to said rotor and having transversely extending, longitudinally spaced concave frame members supporting longitudinally extending rub bars cooperable with said rotor to harvest grain from crop material fed between said rotor and said concave, said concave being adjustably supported on a mounting frame to permit movement of said concave relative to said rotor, the improvement comprising:

said concave being provided with clevis means to permit engagement thereof from a transverse direction with longitudinally extending mounting pins supported by said mounting frame to permit the mounting of said concave on said mounting frame from an access opening in one of said side sheets transversely opposite said mounting pins, said concave being detachably fastened to said mounting frame by connecting links at locations spaced from said mounting pins and said concave further includes linkage

means detachably connected to said concave frame members and associated with said clevis means to positionally





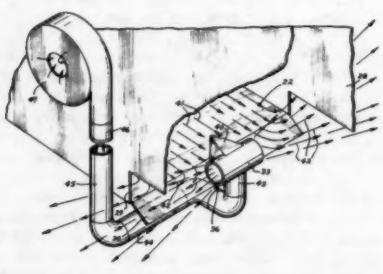
retain said clevis means on said mounting pins during operation of said combine harvester.

4,711,253

CHAFF BLOWER FOR COMBINES

Joseph A. Anderson, Jamestown, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Filed May 19, 1986, Ser. No. 864,713
Int. Cl.[4] A01F *12/48, 29/12*
U.S. Cl. 130—27 R **10 Claims**



1. In a combine having means for separating grain, including a chaffer seive extending in fore and aft directions which discharges chaff outwardly at the rear end of the combine, the improvement comprising:

means for spreading the chaff laterally of the width of the chaffer seive comprising a nozzle member;

means to mount said nozzle member substantially centered on the central longitudinal center line of said combine, said nozzle member having openings facing in opposite directions and forming an air path that is on a nozzle member center line generally perpendicular to the longitudinal axis of the combine; and

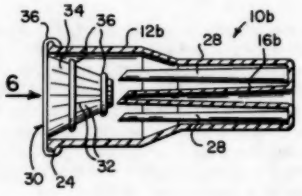
air supply means to provide a high pressure flow of air from said nozzle along the nozzle member center line in opposite directions laterally from the longitudinal centerline of said combine to cause spreading of chaff coming off the chaffer seive laterally from said longitudinal centerline.

4,711,254

CIGAR HOLDER

Nathaniel Fleisher, 8361 NW. 29th Street, Sunrise, Fla. 33322, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Mar. 14, 1986, Ser. No. 839,640
Int. Cl.[4] A24F *7/02, 13/08*
U.S. Cl. 131—189 **2 Claims**



1. A cigar holder comprising a thin cylindrical shaped tube formed of pliable material and adapted at a first open end to receive the butt end of a cigar, said tube further having a second closed mouth end having a plurality of apertures formed therein, said tube further having a plurality of substantially parallel hollow tubular punch members, each punch member extending inwardly from one of said apertures and being provided with a beveled point at the inward end thereof adapted to pierce the butt end of said cigar and to allow free drawing of smoke through the respective punch, one of said punch members substantially coaxial with said tube, said tube further having a drip ring formed around the outer portion of said first open end adapted to prevent moisture from the mouth of the user from wetting the cigar, said tube having a reduced cross section toward the second mouth end thereof, a funnel shaped adapter extending centrally inwardly from said first end and having means for removably securing the adapter onto said drip ring, said adapter further having a plurality of slots forming fingers therebetween, thereby providing a means for holding variously sized cigars, said adapter also being provided with elastic bands around said fingers.

4,711,255

METHOD AND SYSTEM FOR EFFECTING SENSORY EVALUATION OF A SMOKING PRODUCT

Anne S. Syvarth, Kernersville; Harvey H. Gordin, Winston-Salem; Paul D. Early, Jr., Winston-Salem; Kathy A. Needs, Pfafftown, and Thomas A. Perfetti, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sep. 15, 1986, Ser. No. 907,555
Int. Cl.[4] A24F *13/00*
U.S. Cl. 131—330 **14 Claims**

8. A method for effecting sensory evaluation of a smoking product having an end adapted for insertion into the mouth of a smoker and containing an elongated body of smokable material that is gradually consumed by a fire cone which moves toward the mouth end during the smoking process, said method comprising the steps of

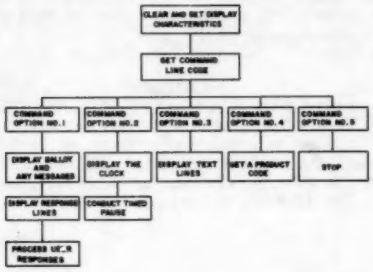
(a) providing a computer and associated display screen having touch sensitive capabilities for communicating instructions and prompts to a sensory evaluation panelist and for receiving responses from said panelist by a stimu-

lus brought into contact with or close proximity to a portion of the display screen,

(b) programming said computer with specific routines and information to generate a predetermined sequence of instructions and prompts on said display screen and to receive responses from said sensory evaluation panelist via the touch sensitive display screen,

(c) presenting said sensory evaluation panelist with a smoking product to be smoked and specifying an attribute to be evaluated,

(d) designating a plurality of segments of predetermined lengths along the elongated body of smokable material,



(e) instructing said sensory evaluation panelist to assign a rating to said attribute as the fire cone moves through each segment designated along said elongated body of smokable material, said rating to be assigned reflecting the intensity of the attribute perceived by said panelist,

(f) receiving a sensory evaluation rating from said panelist for each of said segments reflecting the intensity of said attribute perceived by the panelist as the fire cone moves through each segment and

(g) arranging the sensory evaluation ratings received from said panelist to show any variation in the perceived intensity of said attribute during the smoking process.

4,711,256

METHOD AND APPARATUS FOR REMOVAL OF SMALL PARTICLES FROM A SURFACE

Robert Kaiser, 12 Glengarry, Winchester, Mass. 01890

Filed Apr. 19, 1985, Ser. No. 725,062

Int. Cl.⁴ B08B *3/02, 30/00, 3/12*

U.S. Cl. 134—25.4 **14 Claims**

1. A method for the removal of sub-micron particles from a surface, which comprises the steps of:

A. washing the surface in a solution of at least about 0.1 weight percent of a high-molecular-weight highly-fluorinated organic surfactant in a non-polar highly-fluorinated organic carrier liquid to remove the particles from the surface and disperse them in the solution;

B. subsequently rinsing the surface in a rinsing liquid consisting of a highly-fluorinated organic liquid to remove the surfactant residue therefrom; and

C. removing the rinsing liquid from the surface.

4,711,257

VEHICLE WASHING APPARATUS

Minoru Kobayashi, Tokyo, Japan, assignor to Nisshin Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 873,775

Int. Cl.⁴ B08B *3/00;* **B24B** *5/00*

U.S. Cl. 134—56 R **2 Claims**

1. An apparatus for washing an automotive vehicle, said apparatus comprising:

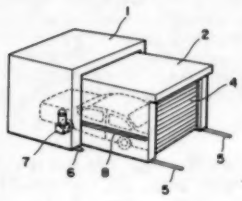
an outer hood having an open front end and a closed rear end;

an inner hood within said outer hood and movable in and out of said outer hood through the open end thereof,

said inner hood having an open front end and an open rear end, and a shutter for closing over the front end thereof,

the outer hood and the inner hood with the shutter closed over the front end thereof defining a washing chamber in which the vehicle is washed;

a pair of parallel guide rail means along which said inner hood moves in and out of said outer hood through the open end thereof; and



washing liquid spraying means within said outer and said inner hood for spraying water on the vehicle in the washing chamber during a first cleaning stage, for spraying water containing a powder onto the vehicle during a second cleaning stage, and for spraying fresh water onto the vehicle during a third cleaning stage at a pressure that is high enough to cause the powder sprayed onto the vehicle during the second stage to move on the surface of the vehicle to remove any dust from the surface of the car.

4,711,258

APPARATUS FOR CLEANING PAINT ROLLER

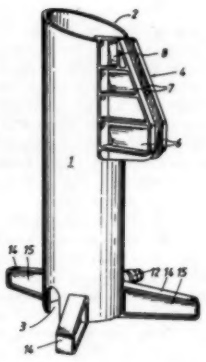
Richard F. Rossborough, Gladstone Park, and Graeme Whitty, Springvale South, both of Australia, assignors to M. J. Chapman; G. K. Sherlock; J. F. Kilby and R. W. Robertson, all of Victoria, Australia

Filed Jul. 7, 1986, Ser. No. 882,405

Claims priority, application Australia, Jul. 5, 1985, PH01338; Aug. 13, 1985, PH01917

Int. Cl.⁴ B08B *3/02*

U.S. Cl. 134—138 **12 Claims**



11. An apparatus for cleaning a paint roller having a connecting arm and a paint roller cover and a connecting arm, comprising:

an elongated housing for receiving the paint roller cover therein;

a liquid outlet member having a plurality of holes opening into the housing and from which, in use, liquid may emerge under pressure;

a drainage opening in the housing through which, in use, liquid may drain from the housing; and

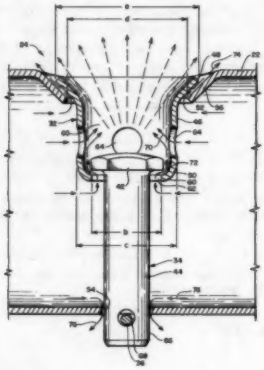
a locating member on the housing for locating the connecting arm of the roller such that, in use, the paint roller cover may be positioned within the housing where liquid emerging from the liquid outlet member holes may strike the roller causing the roller to rotate, the locating member including a plurality of pairs of resiliently flexible fingers, the fingers of each pair being arranged in spaced-apart relationship so as to define a gap therebetween in which, in use, the connecting arm may be received for being releasably gripped between the fingers, so that the connecting arm may be manually slid between the fingers, while remaining gripped therebetween, in directions across and along the fingers for altering longitudinal and lateral disposition of the paint roller cover within the housing relative to the outlet member holes.

4,711,259

MILK TANK CLEANING APPARATUS AND METHOD

Timothy J. Martin, Jr., Lynden, and Richard T. Henry, Bellingham, both of Wash., assignors to Light Industrial Design Company, Lynden, Wash.

Filed Dec. 5, 1984, Ser. No. 678,268
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—166 R **38 Claims**



1. A spray assembly adapted to wash an interior of a tank, such as a milk tank, said assembly comprising:

a. a pipe which is adapted to be positioned in said tank, said pipe having a lengthwise axis and comprising a pipe wall defining a flow passageway, said pipe having first and second through apertures formed in the pipe wall, said apertures being aligned with each other along an axis of alignment which has a substantial alignment component generally perpendicular to the lengthwise axis of the pipe;

b. a nozzle assembly comprising:

1.a discharge nozzle adapted to be mounted in an operating position at said first aperture, said discharge nozzle comprising a side wall having an upper circumferential edge defining a substantially unobstructed upper outlet, said sidewall defining and extending substantially around an impact chamber positioned below the outlet and immediately adjacent thereto, said sidewall having first opening means arranged to direct streams of water radially inwardly into said impact chamber, said first opening means being positioned below the upper circumferential edge of the side wall at a predetermined location so that said streams interact in the impact chamber to form an expanding liquid spray that proceeds directly from the impact chamber upwardly and laterally outwardly from the outlet in an expanding spray pattern;

2.a locating member having a first connecting end arranged to be engaged to said nozzle, a body portion, and a retaining end adapted to extend to said second aperture;

3.a retaining member adapted to releasably engage the retaining end of the locating member to retain the locating member in the pipe and thus maintain the nozzle positioned at the first aperture;

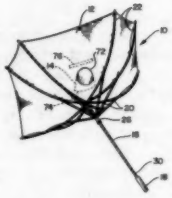
whereby, when the spray assembly is in its operating position, the discharge nozzle is positioned at the first aperture and engaged by the locating member, the retaining member engaging the retaining end of the locating member to maintain the nozzle positioned in the first aperture, and liquid flowing in said pipe can be discharged through said nozzle, and by releasing the retaining member from engagement with the locating member, the nozzle, locating member and retaining member can be removed from the pipe.

4,711,260

APPARATUS WHICH IS CONVERTIBLE BETWEEN AN UMBRELLA AND A GOLFING BACKSTOP

Terry G. Wiens, 1814 196th Street, Langley, British Columbia, Canada V3A 4P4, and William L. Featherston, P.O. Box 1939, Squamish, British Columbia, Canada V0N 3G0

Filed May 23, 1986, Ser. No. 866,784
Int. Cl.[4] A45B *3/00*
U.S. Cl. 135—16 **11 Claims**



1. An apparatus having a first operational mode for use as an umbrella and a second operational mode for use as a backstop to interrupt the travel of a ball, said apparatus comprising:

a. canopy means including (i) a canopy cover having a middle portion, an outer radial portion, and an upper surface, and (ii) a plurality of flexible canopy support ribs, each of which has an inner end portion and an outer end portion, said canopy cover being connected to said canopy ribs in a manner that the inner end portions of the ribs support the middle portion of said canopy cover and the outer end portions of theribs support the outer radial portion of said canopy cover;

b. a support shaft including (i) a lower handle end, and (ii) an upper canopy end to which the inner end portions of said canopy support ribs are pivotally connected; and

c. actuating means for moving said canopy means between (i) a closed position where said canopy ribs have a substantially unbended configuration and said canopy ribs extend in a first downward direction toward said handle end, (ii) an open position in which said canopy ribs have a bended configuration and the outer radial portion of said canopy cover extends downwardly from said middle portion, (iii) a first open inverted position where said canopy ribs extend upwardly in a substantially unbended manner toward said canopy end and the outer radial portion of said canopy cover extends upwardly from said middle portion of said canopy cover, and (iv) a second open inverted position where said canopy ribs have a bended configuration and said outer radial portion of said canopy cover extends upwardly from said middle portion of said canopy cover so that said upper surface of said canopy cover has a concave-like configuration, said canopy actuating means including extension and retraction means which are operatively engaged to said canopy ribs at respective first connecting locations between said inner end portions and said

outer end portions of said canopy ribs for operation in a manner so that upward movement of said extension and retraction menas toward said canopy end causes pivotal movement of said canopy ribs in a radial direction outwardly from said shaft to a location where the apparatus is secured in said first open position and in said first operational mode, and that further upward movement of said canopy extension and retraction means causes said canopy cover to cross an overcentrer location and to occupy said first open inverted position, and then opposite downward movement of said extension and retraction means from open inverted position toward said handle end without crossing the overcenter location displaces said first locations of said canopy ribs downward toward said handle end to place said canopy means in said second open inverted configuration for use in said second operational mode; and

d. fastening means which are connected to said shaft and which engage said extension and retraction means when said canopy means is in (i) the first open position, and (ii) the second open inverted position, to prevent movement of said extension and retraction means in the upward or downward direction and to secure said apparatus in the first and second operational modes, respectively.

4,711,261

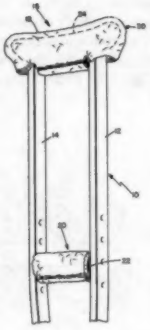
CUSHIONING CRUTCH SUPPORT COVERING

Carol S. Rosenberg, 14 Red Rock Trail, Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 628,256, Jul. 6, 1984, abandoned. This application Nov. 18, 1985, Ser. No. 798,984

Int. Cl.[4] A61H *3/02*

U.S. Cl. 135—72 **6 Claims**



1. A cushioning covering for a load bearing member of a medical crutch, the crutch having a pair of transversely spaced columns, and the load bearing member comprising an underarm support fixed generally between the upper ends of the columns and a cushion disposed upon the underarm support,

said cushioning covering comprising:

an enclosed-volume-defining element formed of a cushioning fabric that is washable, soft to the touch and perspiration absorbent,

said element having top and side portions sized to tightly engage the top and side portions of said cushion and first and second end portions between said side portions, said end portions having first and second peripheral portions,

said element having an opening provided by said side portions and said peripheral portions of said end portions and sized and adapted for passage of the underarm support and cushion through said opening into the volume of said element defined by said top, side, and end portions, and

means disposed adjacent said opening for releasably securing said cushioning covering tightly about the entire surface of the load-bearing member, said securing means comprising:

elastic means for gathering said first and second peripheral portions beneath an underarm support, about exposed, outer edges of crutch columns, and

first and second elongated flaps extending from said side portions and adapted for overlapping interengagement along the lengths of said elongated overlapping flaps beneath the underarm support, between opposed inner edges of crutch columns, to provide tight secured fitting of said covering entirely around said load bearing member.

4,711,262

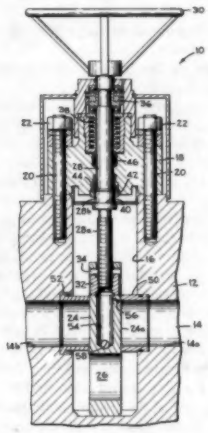
UNI-DIRECTIONAL/BI-DIRECTIONAL GATE VALVE

Don B. Wafer, and Claud C. Barrington, both of Houston, Tex., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 696,959, Jan. 31, 1985, abandoned. This application Mar. 3, 1986, Ser. No. 837,317

Int. Cl.[4] F17D *1/18*

U.S. Cl. 137—14 **2 Claims**



1. A method of changing the sealing mode of a gate valve from bi-directional to uni-directional, said gate valve comprising:

(a) a valve body with a flow passage, a gate valve chamber intersecting said flow passage, a bi-faced valve gate in the chamber, and valve seat means;

(b) the valve gate being positionable in a range of bi-directional flow positions to pass fluid flow in the passage;

(c) the valve gate, in cooperation with the valve seat means, operable in a first position to provide bi-directional sealing;

(d) the valve gate having relief port means operable in a second position of the valve gate to provide communication between the gate valve chamber and a first face of the valve gate, the valve seat means cooperating with a second face of the valve gate to block fluid flow directed out from the second face into the passage in the case of the first face facing upstream and the second face facing downstream, but to let fluid flow in the opposite direction past said second face into the gate chamber and thence through the relief port means and out from the first face; and

(e) means for moving the valve gate between the positions; the method comprising the steps of:

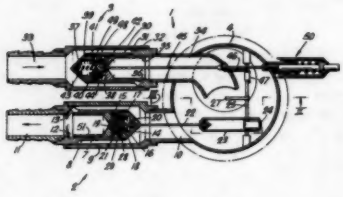
(1) operating the moving means for placing the valve gate in one of the bi-directional flow positions or the first position; and

(2) operating the moving means to station the valve gate in the second position for uni-directional sealing.

4,711,263
DOUBLE-ACTING VALVE SYSTEM FOR UNDERWATER BREATHING OR THE LIKE

Nils T. Ottestad, Lyngun 27, 3100 Tønsberg, Norway, assignor to Nils T. Ottestad, Tønsberg and Den Norske Stats Oljeselskap A.S., Stavenger, both of, Norway

Filed Sep. 15, 1986, Ser. No. 907,102
Claims priority, application Norway, Sep. 18, 1985, 853654
Int. Cl.[4] A62B 7/04
U.S. Cl. 137—102 4 Claims



1. A double-acting valve device, especially a demand breathing regulator for divers, comprising

a chamber having a flexible diaphragm arranged therein and forming a wall of the chamber,

an inhalation valve and an exhalation valve of which each is in communication with said chamber, and

operating means including a transmission mechanism interconnecting said diaphragm and said valves, the mechanism being arranged to open the inhalation valve upon movement of said diaphragm inwardly in the chamber from an intermediate position, and to open the exhalation valve upon movement of said diaphragm outwardly in the chamber from said intermediate position,

said valve being oppositely oriented in relation to said chamber and each of said valves having an inlet side and an outlet side and being of the type comprising

a valve body in the form of a main piston which is slidably arranged in a piston guide, a sealing seat for the piston at one end of the piston guide, and the other end of the piston guide having a closed end portion and defining together with an end face of the piston, a chamber communicating through a narrow passage with the outlet side, the piston being provided with a pressure-equalizing channel between the chamber and the outlet side, and a control valve arranged to close and open said channel by an operating means connected to said transmission mechanism and arranged to move the piston away from its seat only after having opened said control valve,

said control valve comprising a piston-shaped valve stem which is slidable in a cylindrical guide in the main piston and cooperates with a seat in said end face of the main piston, and said valve stem being connected to said operating means, and an axial lost-motion connection between said valve stem and the main piston, said lost-motion connection comprising at least one protruding pin carried by said valve stem within a short axial slot in the main piston.

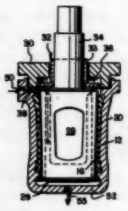
4,711,264
PLUG VALVE

Richard J. Medvid, Cookeville, Tenn., assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Nov. 13, 1986, Ser. No. 930,195
Int. Cl.[4] B08B 3/00, 9/00; F16K 51/00
U.S. Cl. 137—241 3 Claims

1. A plug valve providing internal sterilization of the plug without disassembly, including a casing having a plug cavity and inlet and an outlet port opening into said cavity, a plug having upper and lower end surfaces and a side wall, said plug received in said casing having a through port through said side wall selectively alignable with said casing ports, and seal means in said casing cooperating with said plug side wall and isolating said ports with respect to said plug, the improvement comprising:

means in said plug defining a pair of steam passages extending generally longitudinally through the interior of said plug in non-intersecting and adjacent relation to said through port, one each of said steam passages on each side of said through port, and each said passage opening at one of said plug end surfaces,



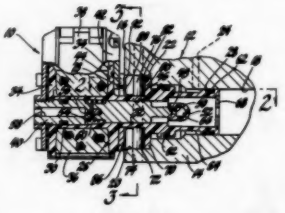
means in said casing for conducting sterilizing steam to said pair of passages at said one plug end surface for sterilizing the exterior of the plug, the through port, and the seal means by heat conduction without direct steam sterilization being applied to the exterior of the plug, the through port, and the seal means to prevent the possibility of contamination, and

means in said casing for removing steam from said passages.

4,711,265
SPRING AND WASHER DEVICE

Ronald G. Davis, Anderson; Charles D. Denniston, Middletown, and Richard K. Van Skyock, Yorktown, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 16, 1987, Ser. No. 26,192
Int. Cl.[4] F15B 13/044
U.S. Cl. 137—454.2 3 Claims



1. In a pin-type cantilever mounting arrangement for a solenoid valve on a control valve body;

said control valve body including a planar wall, a fluid pressure bore perpendicular to and intersecting said planar wall, and a counterbore in said planar wall around said fluid pressure bore; and

said solenoid valve including a tubular plastic body having an O-ring end and a coil end separated by a minimum wall thickness flux gap portion, an annular plastic flange on one side of said flux gap portion, and a coil body rigidly connected to said sleeve on the other side of said flux gap portion at said coil end;

said O-ring end of said sleeve being plugged into said pressure bore with said annular flange abutting the bottom of said counterbore whereby said coil body end and said flux gap portion of said plastic body are supported on said control valve body in cantilever beam fashion with said flux gap portion in said counterbore;

said plastic body being retained in said pressure bore by a pair of retaining pins disposed on said control valve body and intersecting said counterbore on opposite sides of said plastic body adjacent said annular flange of said plastic body;

a combination spring and washer device comprising:

a C-shaped planar flat washer portion disposed around said flux gap portion of said plastic body between said annular flange and each of said retaining pins,

said flat washer portion distributing compression forces between said retaining pins and said annular flange across said annular flange to prevent plastic creep,

a pair of integral webs at diametrically opposite locations on said flat washer portion extending generally perpendicular to the plane of said flat washer portion, and

a pair of spring arms integral with respective ones of said webs extending radially inward toward said plastic body and resiliently engaging said coil body thereby to impose preload tensile forces on said plastic body across said flux gap portion,

the magnitudes of said preload tensile forces being calculated to substantially equal dynamic compression forces on said plastic body produced by cantilever beam bending of said plastic body due to concentration of the mass of said coil body at said coil end of said plastic body.

4,711,266

VALVE ARRANGEMENT

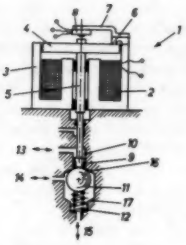
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 415,613

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3213008

Int. Cl.⁴ F16K *37/00, 31/02*

U.S. Cl. 137—554 **6 Claims**



1. A valve arrangement,

said valve arrangement including a valve body adapted to assume at least two positions in a flow chamber for the purpose of controlling fluid flow through a fluid flow passage,

a monitor means for monitoring said at least two positions of said valve arrangement for determining in which position said valve arrangement is positioned,

a slide means secured to said valve body and movable in said fluid flow passage when said valve body is unseated from said fluid flow passage and moved to one of said at least two positions,

said slide means closing said fluid flow passage against fluid flow until said slide means is free of said fluid flow passage.

4,711,267

HYDRAULIC CONTROL BLOCK

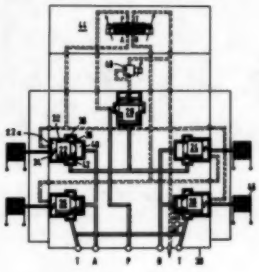
Hans Schwelm, Howald, Fed. Rep. of Germany, assignor to Hydrolux S.a.r.l., Luxembourg

Filed Feb. 12, 1986, Ser. No. 833,485

Claims priority, application Luxembourg, Feb. 13, 1985, 85774

Int. Cl.⁴ F15B *13/043*

U.S. Cl. 137—596.15 **4 Claims**



1. A hydraulic control block for hydraulic units, especially for controlling double-acting hydraulic cylinders, comprising a valve housing block having a base surface and having four bores each forming a respective one of four seat valves arranged in pairs above one another and opposite one another in first and second planes parallel to the base surface of the housing block, each seat valve comprising a cylindrical bore portion defined by a respective one of said bores providing a piston space and a piston member having a cylindrical bore portion slidable in said piston space guided by and in surface contact with the cylindrical bore portion, the piston member having a conically tapered end portion and said bores each having a smaller diameter cylindrical valve space extending from an end of said piston space and defining a circular valve seat against which the tapered end portion of the piston member seats in closed position, a spring urging each piston member towards said closed position,and each bore having and annular space outwardly encircling the cylindrical bore portion adjacent the associated valve seat; the housing block having internal conduits including a pump conduit and a pressure-reducing valve connected thereto and through conduits in the housing block to the annular spaces of the pair of valve bores in said first plane, a tank conduit in said block connected to the annular spaces of the pair of valve bores in said second plane and to a pilot valve, first and second working line conduits connected to the valve spaces of each respective pair of upper and lower valve bores arranged one above another, and working line conduits cross-connected between the piston spaces of each upper valve bore of said first plane and the opposite lower valve bore of said second plane for selective connection to said pilot valve, whereby the valves located diagonally opposite one another are controllable in pairs by the pilot valve and by the pressure reducing valve.

4,711,268

VALVE MANIFOLD

Edward R. Coleman, 192 Deerbow Circle SE., Calgary, Alberta, Canada

Filed Feb. 19, 1986, Ser. No. 830,830

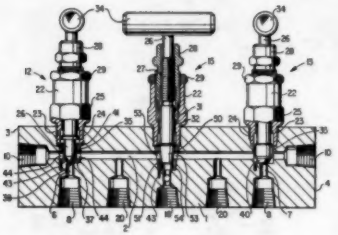
Claims priority, application Canada, Jan. 28, 1986, 500501

Int. Cl.⁴ F16K *11/22*

U.S. Cl. 137—597 **8 Claims**

1. A four valve manifold for use with a flow meter or other instrument comprising body means, a flow passage extending longitudinally through said body means; a pair of inlet passages in said body means for introducing process fluid into said flow passage; a pair of outlet passages in said body means for discharging process fluid from said flow passage; a pair of line

block valves for opening or closing said inlet passages while permitting process fluid to flow through said flow passage; a vent passage in fluid communication with said flow passage, and a vent valve for controlling the venting of fluid from said



vent passage; and an equalizer valve between said line block valves for simultaneously closing said flow passge between said line block valves and said vent passage upstream of said vent valve.

4,711,269

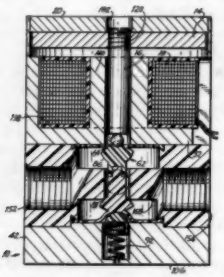
SOLENOID VALVE

Akos Sule, 4 Gates Ave., Roseland, N.J. 07068

Continuation-in-part of Ser. No. 318,846, Nov. 6, 1981, abandoned. This application Jul. 18, 1985, Ser. No. 756,845

Int. Cl.[4] F15B *13/044;* **F16K** *31/06, 7/00*

U.S. Cl. 137—625.5 **26 Claims**



1. A solenoid valve comprising a valve body having a valve cavity,

first port means disposed on said valve body and communicating with said valve cavity,

second port means disposed on said valve body and communicating with said valve cavity,

an orifice member having an orifice, with said orifice member mounted in said valve cavity and disposed separating said first and second ports,

electrically operated solenoid means mounted on said valve body and including a solenoid coil and armature means disposed for actuation by said solenoid coil,

diaphragm means mounted in said valve cavity,

poppet means formed as part of said diaphragm means with said poppet means operative to close said orifice,

with said diaphragm means and said poppet means comprising an integrally formed unitary member and with said poppet means comprising a semi-sperical end portion and a conical portion with said conical portion having a larger diameter and a smaller diameter and with said larger diameter of said conical portion disposed adjacent said semi-spherical end portion, and said smaller diameter disposed adjacent said diaphragm,

resilient means mounted in said valve cavity and disposed to bear on said diaphragm means and bias said diaphragm means and said poppet means in a first direction,

pressure plate means disposed in said valve cavity and supporting a portion of said diaphragm means thereby enhancing the ability of said diaphragm means to withstand fluid pressure and with said solenoid means capable of biasing said diaphragm and poppet means in a second direction which is opposite to said first direction.

4,711,270

THERMOELECTRIC VALVE FOR CHANNELING REFRIGERANT GASES INTO DIFFERENT TUBES IN REFRIGERATION DEVICES

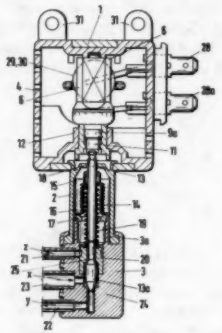
Paolo Fornasari, Casale Monferrato, Italy, assignor to Eltek S.p.A., Alessandria, Italy

Filed Dec. 31, 1986, Ser. No. 948,416

Claims priority, application Italy, Jan. 27, 1986, 67062 A/86

Int. Cl.[4] F16K *31/68*

U.S. Cl. 137—625.5 **7 Claims**



1. A thermoelectric valve assembly for channeling refrigerant gases into different tubes of refrigeration devices comprising

two assembled elements, said elements being a thermoelectric and a mechanical element,

said thermoelectric element comprising

a casing hermetically enclosing a thermally expandable waxy mass, a plunger for being acted upon by said waxy mass, and a ceramic dish for being acted upon by said plunger, said casing being sealed by an elastic seal axially associated with said plunger and ceramic disk, and

an outer portion of said casing having two thermistors attached to it and connected to two terminals (**28,28***a*) providing electric power,

said mechanical element comprising

a tube connecting said thermoelectric element, a three-way needle valve having a body, a needle head being comprised in the mechanical element; and a rod that is axial with said ceramic disk and plunger and passes through a perforated base of said tube,

a metal

bellows hermetically containing a cylindrical spring together with said rod,

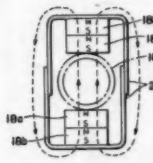
wherein

the needle head is mounted so it can move in a bushing contained in the body of said three-way needle valve,

the ends of said belows are welded on an outer circumference of said rod and on a collar contained in said tube connecting the rest of said three-way needle to a bracket, and

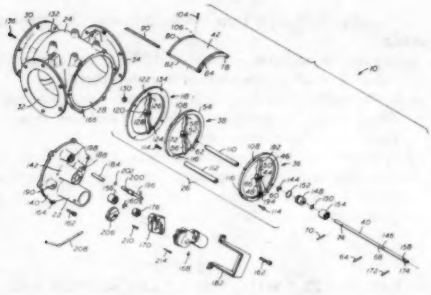
said bracket supports a housing made of insulating material enclosing the thermoelectric element.

4,711,271
MAGNETIC FLUID CONDITIONER
Gale M. Weisenbarger, 140 Woodland Dr., Eaton, Ohio 45320, and John C. Moran, 3124 Lake Ave., Fort Wayne, Ind. 46805
Filed Dec. 15, 1986, Ser. No. 942,003
Int. Cl.[4] F15C *1/04*
U.S. Cl. 137—827 12 Claims



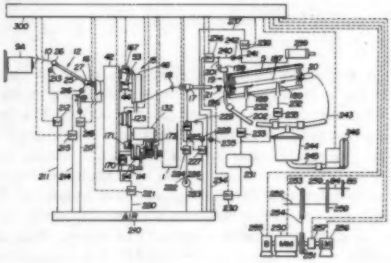
1. A magnetic fluid conditioner for acting on a fluid being transmitted through a conduit, said fluid conditioner comprising:
(a) a housing having an open top side and a closed bottom side and closed ends, the closed ends each having an aperture therethrough in co-axial alignment;
(b) an elongated conduit passing through the apertures in the ends of said housing and extending from both ends thereof;
(c) at least two permanent bar magnets in said housing positioned in opposition at the periphery of said conduit, and with a pole on each magnet positioned along said conduit being directly adjacent to the periphery of said conduit; and,
(d) a plurality of magnetic metallic pole pieces bridging the magnets on opposing sides of said conduit to provide a metallic flux path between said magnets; said conduit, magnets, and pole pieces being retained in fixed relationship within said housing.

4,711,272
SURGE IRRIGATION VALVE
Michael D. Wiseman, Houston, Tex., assignor to Hydro-Pulse, Inc., Houston, Tex.
Filed Jan. 12, 1987, Ser. No. 2,750
Int. Cl.[4] F16K *11/07*
U.S. Cl. 137—887 17 Claims



1. A valve for use in distributing irrigation water in a surge irrigation system, comprising:
(a) a valve body having a cylindrical cavity, an inlet port and a plurality of outlet ports, said cylindrical cavity and said inlet port being substantially in coaxial alignment; and
(b) a diverter member rotatably and coaxially mounted within said cylindrical cavity, said diverter member comprising:
(1) a pair of circular support rings, each of said support rings having a central hub, an outer ring, and a first and second spoke radiating from said central hub to said outer ring,
(2) an axially aligned central shaft extending through said diverter member centrally and spatially supporting said circular support rings, and
(3) an arcuate diverter plate conforming to the curvature of said cylindrical cavity mounted to the periphery of said support rings on said outer rings in a spatial relationship with respect to the cylindrically arcuate interior surface of said valve body, said diverter plate being selectively aligned with one of said outlet ports upon rotation of said diverter member so as to cover and restrict the flow of irrigation water through said aligned outlet port and so as to divert the flow to the remaining outlet ports.

4,711,273
LOOM
Takatsugu Kato, Tokyo, and Takao Takahashi, Hachioji, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Continuation of Ser. No. 686,702, Dec. 27, 1984. This application Sep. 2, 1986, Ser. No. 903,876
Claims priority, application Japan, Dec. 28, 1983, 58-245211; Apr. 6, 1984, 59-67383
Int. Cl.[4] D03D *47/30*
U.S. Cl. 139—116 9 Claims



1. A loom having a weft inserting nozzle and a reed, comprising:
means defining a guide space through which a weft yarn projected from the weft inserting nozzle passes to be picked, said guide space defining means being movable together with the reed and locatable between the weft inserting nozzle and warp yarns;
means defining an air flow passage merging in said guide space; and
means developing an air stream for forcing the weft yarn lying in said guide space into said air flow passage, said air stream developing means including an air ejection means for ejecting air through said guide space into said air flow passage, and an air suction means for sucking air within said guide space into said air flow passage, said air ejection means including a second pipe member connected at its first end to said first pipe member and fluidly connected at its second end to a pressurized air source, said air suction means including a third pipe member connected at its first end to said first pipe member and fluidly connected at its second end to an air suction source;
wherein said air flow passage defining means includes a first pipe member which is connected to said guide member and whose axis is generally perpendicular to the weft yarn lying in said guide space; and
wherein said guide member is flattened pipe having opposite parallel pipe walls, said parallel pipe walls being formed with openings, respectively, whose axes are aligned with each other and substantially parallel with the weft yarn

lying in said guide space, each pipe wall opening forming part of said guide space.

4,711,274

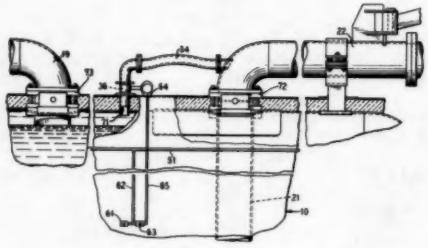
EXTERNAL PURGE SYSTEM FOR A TANK TRAIN

Erling Mowatt-Larssen, Valparaiso, Ind., assignor to General American Transportation Corporation, Chicago, Ill.

Continuation of Ser. No. 851,868, Apr. 11, 1986, abandoned, which is a continuation of Ser. No. 631,080, Jul. 16, 1984, abandoned. This application Mar. 26, 1987, Ser. No. 31,181

Int. Cl.[4] B65B *1/04*

U.S. Cl. 141—5 2 Claims



1. A method of filling and purging a string of tank cars which are interconnected by conduits comprising the steps of, supplying lading into the bottom of a first tank car at a first end of said first tank car to fill said first tank car through a first conduit, supplying lading into the bottom of a second tank car at a first end of said second tank car from the top of the second end of said first tank car through a second conduit to fill said second tank car and so on down the string of tank cars until they are all filled, opening a plurality of valves which can be positively opened and closed in said first and second conduits and which have outlets at said first ends at the top of said first and second tank cars, said valves being opened by an operator from a position remote from the valves, and supplying a purge gas at said first end into the top of said first car through said valve in said first conduit and into the first end at the top of said second tank car through said valve in said second conduit so as to purge the second conduit between the first and second tank cars and so on down the string of tank cars until all of the conduits have been purged.

4,711,275

AIR SUPPLY AND CONTROL APPARATUS FOR INFLATABLE MATTRESS

Victoria L. Ford, Southsea, and Bryan J. Morgan, London, both of England, assignors to Pegasus Airwave Limited, Portsmouth, United Kingdom

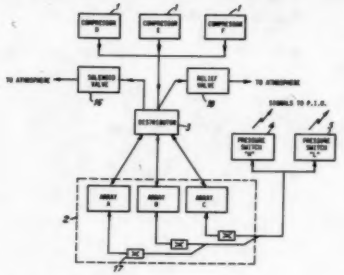
Filed Dec. 1, 1986, Ser. No. 936,229

Claims priority, application United Kingdom, Dec. 4, 1985, 8529809

Int. Cl.[4] B67C *3/12*

U.S. Cl. 141—95 12 Claims

1. Air supply and control apparatus for an inflatable mattress comprising a plurality of air compressors for inflating the mattress; control means providing a first mode of operation in which the compressors are operated sequentially and cyclically, and a second mode of operation in which at least two of the compressors are operated simultaneously; and pressure sensing means connected to the control means for switching



from said first to said second mode of operation if the pressure in the mattress falls below a higher preset level.

4,711,276

FILLING DEVICE WITH INTERCHANGEABLE VALVE MEMBER FOR CANS OF DIFFERENT DIAMETERS

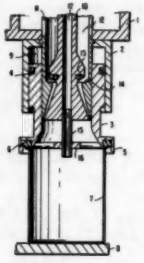
Adriano Simonazzi, Via La Spezia 241/a, 43016 Parma, Italy

Filed Apr. 23, 1986, Ser. No. 854,974

Claims priority, application Italy, Apr. 29, 1985, 3422 A/85

Int. Cl.[4] B67C *3/34*

U.S. Cl. 141—286 5 Claims



1. A filling device for cans having different diameters comprising:

filling means including a cylindrical filling tube having valve means and air passage means disposed therein;

a downwardly opening cylindrical housing surrounding said filling means coaxially therewith and defining an annular thrust chamber therebetween; and

a cylindrical valve member slidably mounted in said thrust chamber and having sealing means at the lower end thereof adapted to engage the upper rim of a can supported below the filling tube.

4,711,277

FILLER NOZZLE WITH CAPILLARY ACTION AND ITS METHOD OF OPERATION

Robert J. Clish, Mobile, Ala., assignor to International Paper Company, Purchase, N.Y.

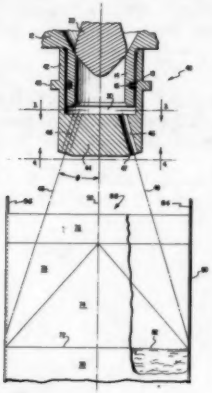
Filed Jul. 23, 1982, Ser. No. 401,254

Int. Cl.[4] B65B *3/04;* B67C *3/22*

U.S. Cl. 141—311 A 9 Claims

1. A filling nozzle particularly adapted to fill containers with potable liquids containing pulp fibers therein, such as fruit juices, the containers having top seal areas and a maximum intended fill level, which is below the top seal area, the nozzle being adapted for mounting on a valve, the valve having a

valve seat for closing the valve when it is desired to stop flow through the nozzle, the nozzle including an orifice head having upper and lower surfaces, wherein the orifice head has an imaginary longitudinal axis, the orifice head having a plurality of spaced-apart fluid passageways extending completely through the orifice head, each said passageway being angled such that the stream of liquid flowing therethrough strikes the container at an inside wall portion thereof at a point above said maximum intended fill level of the container, each such passageway having an uppermost part and an exit end, the uppermost part of each said passageway lying in the same plane as the upper surface of said orifice head, said plane being perpendicular to the imaginary longitudinal axis of said orifice head and wherein the spacing between the uppermost portions of said angularly disposed passageways is at least about 1/32 of an inch, whereby a land portion of about 1/32 of an inch is defined between the uppermost portions of said passageways to thereby inhibit the build-up of pulp fibers which may be in said potable liquid flowing through the nozzle, and wherein the angle between the longitudinal axes of the exit end of the passageways and said imaginary longitudinal axis of the nozzle is less than 90°, the ratio of the length of the passageways to their diameter or width having a mimimum value of four, and being such that when the valve is shut off to stop the flow of liquid through the valve and through the nozzle, capillary attraction of the liquid within the passageways is great enough to prevent further flow through the passageways, whereby closing the valve will not only stop fluid flow through the valve, but will also prevent dripping and drooling of the liquid through the passageways of the orifice head, until such time as the valve is again opened and fluid flow through the passageways recommences.



4,711,278

TREE PRUNING MACHINE

Tanitomi Fuminao, Houtaku, Japan, assignor to Kaisei Kogyo Corporation, Japan

Filed Sep. 10, 1986, Ser. No. 905,989

Int. Cl.[4] A01G *23/02*; B27L *1/00*

U.S. Cl. 144—2 Z **6 Claims**

1. A tree pruning machine comprising:

a generally annular body;

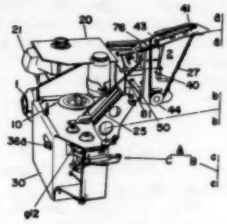
means for elevating the body vertically on the tree;

a cutting unit mounted on the body;

means for rotating the cutting unit around a periphery of the body;

means, connected to the cutting unit, for detecting resistance to the cutting unit by a branch; and

means, controlled by the resistance detecting means, for reducing the speed of rotation of the cutting unit around the periphery of the body when a prescribed branch cutting resistance is detected.



4,711,279

DEVICE FOR SHAVING THE SIDES OF TREE TRUNKS

Alfred Reuter, Oberkirch, Fed. Rep. of Germany, assignor to Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck", Oberkirch, Fed. Rep. of Germany

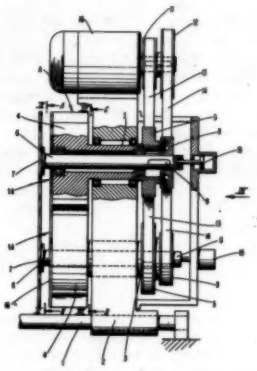
PCT No. PCT/EP85/00185, § 371 Date Dec. 30, 1985, § 102(e) Date Dec. 30, 1985, PCT Pub. No. WO85/05063, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 25, 1985, Ser. No. 822,304

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415932

Int. Cl.[4] B27C *9/04*

U.S. Cl. 144—39 **5 Claims**



1. Apparatus for cutting wood logs for the production of sideboards and chips comprising:

means for displacing wood logs,

an upstream log cutter including a pair of upstream side cutters for cutting opposite first sides of a log as the log is displaced, and

a downstream log cutter arranged downstream of said upstream log cutter and including a pair of downstream side cutters for cutting opposite second sides of the log.

each of said upstream and downstream side cutters comprising two cooperating rotary tools rotatable about parallel axes, said axes oriented at acute angles relative to vertical,

each of said tools including:

a knife head carrying a plurality of circumferentially spaced cutting edges,

a first circular saw blade mounted coaxially at an end of said knife head and including a plurality of circumferentially spaced cutting edges, and

a second circular saw blade spaced coaxially from said

first saw blade and including a plurality of circumferentially spaced cutting edges,

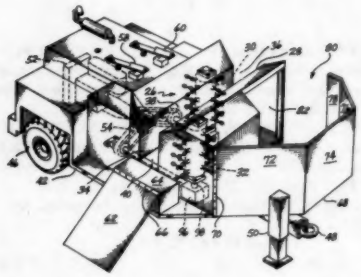
said two knife heads of each said side cutter having their cutting edges circumferentially offset and in intermeshing relationship, said two first saw blades of each side cutter having their cutting edges circumferentially offset and in intermeshing relationship, said two second saw blades of each side cutter having their cutting edges circumferentially offset and in intermeshing relationship.

4,711,280

VERTICAL FLAIL DELIMBER

Phillip A. Schmidt, Des Moines Marina, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jul. 14, 1986, Ser. No. 885,353
Int. Cl.[4] B27L *1/00*
U.S. Cl. 144—208 J **12 Claims**



1. A flailing apparatus for substantially delimbing and/or debarking at least one elongated tree stem comprising:

a housing having at least front and rear openings,

at least two rotatable flail members mounted in the housing with one being longitudinally and laterally offset from the other and each being substantially vertically upstanding within the housing,

a plurality of flexible flail segments mounted on each flail member sized so that the segments will extend a distance greater than half the lateral dimension of the opening extending through the housing when the flail members are rotated, and

means for rotating the flail members.

4,711,281

CURVED WOOD BENDING MACHINE

Michael Kessel, 138 Preston Rd., Milford, N.J. 08848; Erwin Kessel, 124 Old Croton Rd., Flemington, N.J. 08822, and Eugene Schneider, R.D. 3, Box 474, White House Station, N.J. 08889

Filed Mar. 5, 1986, Ser. No. 836,476
Int. Cl.[4] B27H *1/00*
U.S. Cl. 144—256.1 **14 Claims**

1. A curved wood bending machine for bending elongated wooden members into predetermined shapes comprising,

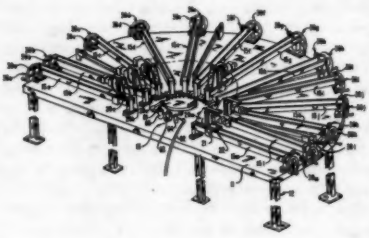
a. support means,

b. a plurality of circumferentially spaced guide rails connected to the support means and each of said guide rails disposed to extend radially outward on said support means from a predetermined center point so the longitudinal line of each rail lies parallel to a predetermined radial plane,

c. said guide rails having, an inner end and an outer end,

d. a clamping assembly slidably mounted on each of said plurality of guide rails, and

e. actuating means on each of said guide rails operatively connected to the associated clamping assembly on said guide rails to move the clamping assembly to and fro along the longitudinal line of the associated guide rail to enable the clamping assembly to be positioned relative each clamping assembly on the associated plurality of circumferentially spaced guide rails to establish a predetermined curved shape for bending said elongated wooden member in said curved wood bending machine.

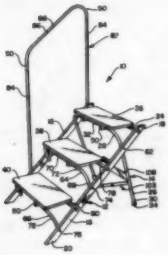


4,711,282

PORTABLE AND COLLAPSIBLE STAIR

Stanley J. Frazier, 1523 125th Ave. SE., Bellevue, Wash. 98005, and Blaine Sorenson, 18813 SE. Lake Holm Rd., Auburn, Wash. 98002

Filed Jun. 6, 1986, Ser. No. 871,716
Int. Cl.[4] E06C *1/383*
U.S. Cl. 182—106 **17 Claims**



1. A collapsible stair comprising:

a. a first inverted U-shaped support member comprising two laterally spaced first legs, each having a first lower support end and a first upper end, and a first cross member interconnecting the first upper ends;

b. a second inverted U-shaped support member having two second legs, each having a second lower support end and a second upper end, and a second cross member interconnecting the second upper ends of the second legs, said first and second legs being pivotally connected to one another at a first pivot axis located between the upper and lower ends of the first and second legs;

c. said first and second U-shaped members having a collapsed position where each of said first legs is adjacent to, and generally parallel to, an adjacent one of said second legs, and an operating position where the first legs are crossed with the second legs at an angle, with the first and second cross members being spaced from one another and lying in a common generally horizontal plane, and the lower first ends being positioned forwardly of the lower second ends;

d. a first upper support platform having a rear edge portion hinge connected to said first cross member at a second pivot axis, and being movable between a first stowed position, where the upper platform extends downwardly from the first cross member so as to be djacent to, and generally parallel to, said first legs, and a second horizon-

tal support position where a forward edge portion of the first platform is supported by said second cross member;

e. a third inverted U-shaped member comprising two third legs having lower ends pivotally connected to the first legs at a third pivot axis positioned below said first pivot axis, and a third cross member conneceed to and extending between upper ends of the third legs, said third U-shaped member having a third stowed position where the third legs are positioned adjacent to, and parallel to, the first legs, and a fourth support position where the third legs extend from the third pivot axis upwardly from the first legs;

f. a second lower support platform having a rear edge portion pivotally mounted to and positioned between said first legs at a fourth pivot axis located between the upper and lower ends of the first legs, and being movable between a fifth stowed position, where the lower plaform extends downwardly from said fourth pivot axis so as to be adjacent to, and parallel to, said first legs, and a sixth horizontal support position where a front edge portion of the second platform is supported from said third inverted U-shaped member in its support position;

g. said second lower platform having mounting member means connected thereto and defining an elongate slot means having a substantial lengthwise alignment component generally narallel to a plane occupied by said second lower platform, said third cross member of said third inverted U-shaped member being positioned in said slot means in a manner to be movable from a rear end of said slot means, at which said third cross member is positioned when the second lower platform is in its fifth stowed position, to a second forward end of said slot means at which said third cross member is positioned when the second lower platform is in its horizontal support position;

h. said stair being characterized in that a first distance between a portion of said third cross member located in said slot means to said third pivot axis is less than a distance between said third pivot axis and said fourth pivot axis, whereby when said second lower platform moves from said sixth support position to said fifth stowed position, said second lower platform rotates about said fourth pivot axis downwardly toward said third pivot axis; and

i. said stair being further characterized in that with said third U-shaped member in said fourth support position, said third legs have a substantial vertical alignment component greater than any horizontal alignment component of the third legs, whereby said third legs are positioned to effectively carry compression loading vertically from said second platform.

4,711,283

HEAVY DUTY PNEUMATIC TIRE TREAD WITH LUG AND BLOCK PATTERN

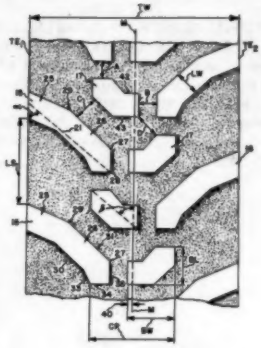
Mark L. Bonko, Hartville, and Loran C. Lopp, Jr., Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1987, Ser. No. 8,690
Int. Cl.[4] B60C *11/11*
U.S. Cl. 152—209 B **20 Claims**

1. A pneumatic tire comprising a radial ply carcass and a belt structure extending circumferentially about the axis of rotation of the tire, a tread portion extending circumferentially around said carcass and belt structure, and said tread portion comprising:

(a) two sets of traction lugs, each lug of said first set of traction lugs extending from a first lateral edge of the tread towards the mid-circumferential plane of the tire at a general inclination in the range of 45° to 60° with respect to the mid-circumferential plane of the tire to an axially inner end located an axial distance of 35% to 45% of the tread width from said first lateral edge of the tread, and each lug of said second set of traction lugs being similar to the lugs of the first set of traction lugs but opposite in hand and extending from a second lateral edge of the tread, each lug of said second set being offset circumferentially of said tire with respect to the next adjacent pair of lugs of the first set of traction lugs; and

(b) a plurality of block elements disposed in a central portion of the tread, each of said traction lugs having a single block element circumferentially aligned with an edge or edges of the traction lug connecting a leading and a trailing edge of the traction lug at the axially inner end of the traction lug, each block element being oriented at an angle



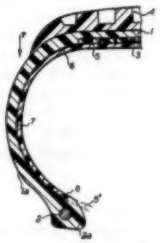
in the range of 45° to 60° with respect to the mid-circumferential plane of the tire, between 80% to 90% of the axial extent of each block element being disposed on the opposite side of the mid-circumferential plane from said circumferentially aligned traction lug, and each block element having a radially outer surface which communicates with a base portion of the tread by means of a wall or walls, the radially measured height of said wall or walls varying by not more than 25% around the periphery of said block element.

4,711,284

PNEUMATIC TIRE

Oskar Schmidt, Bruck an der Leitha, Austria, assignor to Lim Kunststoff Technologie Gesellschaft m.b.H., Kittsee, Austria

Filed Apr. 4, 1985, Ser. No. 719,758
Int. Cl.[4] B60C *9/00, 1/00*; B32B *27/40*
U.S. Cl. 152—452 **8 Claims**



1. A reinforced side wall pneumatic tire comprising:

an outer elastomeric tire body having a tread along its outer periphery, opposing side walls adjoining said tread, and respective beads along inner peripheries of said side walls;

a bead core embedded in each of said beads;

an inner elastomeric body embedded in said outer body along said tread and said side walls and in continuous contact therewith, the elastomer of said inner elastomeric body having a hardness and modulus of elasticity which

are each less than the hardness and modulus of elasticity of the elastomer of said outer elastomeric body;

a radial reinforcement embedded in said inner body and thereby incorporated in the tire as the side wall reinforcement thereof; and

anchor elements embedded in said inner elastomeric body proximal to said beads and around which said radial reinforcement is looped.

4,711,285

HIGH-PERFORMANCE PNEUMATIC TIRE HAVING BEAD FILLERS OF ANISOTROPIC ELASTICITY

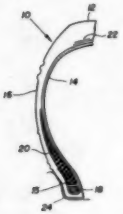
Masaki Ogawa, and Takabumi Kudo, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,949

Claims priority, application Japan, Jul. 16, 1984, 59-145919

Int. Cl.⁴ B60C *9/06, 9/08, 15/06*

U.S. Cl. 152—458 **9 Claims**



1. A high-performance pneumatic tire comprising:

a tread;

side walls;

a carcass which comprises layers of rubberized cords laid parallel and is wrapped around a bead in each edge portion thereof so as to provide a turn-up portion; and

a bead filler for each bead, which fills up a space between the turn-up portion of the carcass and a major portion of the carcass and extends along the outer side of the carcass toward the tread, each bead filler comprising a rubber composition which comprises about 100 parts by weight of a rubber component and from about 15 to 70 parts by weight of short fiber filaments having a mean diameter of less than about 1 μm wherein the material of said short fiber filaments comprises a thermoplastic polymer, said fibers being oriented to an extent sufficient so that the rubber composition is anisotropic to a degree that the modulus of elasticity of the bead filler measured under tension in the circumferential direction of the tire to the extent of about 20% stretch is greater than about 40 $kg/cm^2$and is in a range of between about 2 and about 6 times as high as the modulus of elasticity of said bead filler measured under tension in the radial direction of the tire to the extent of about 20% stretch.

4. A high-performance pneumatic tire comprising:

a tread;

side walls;

a carcass which comprises layers of rubberized cords laid parallel and is wrapped around a bead in each edge portion thereof so as to provide a turn-up portion; and

a bead filler for each bead, which fills up a space between the turn-up portion of the carcass and a major portion of the carcass and extends along the outer side of the carcass toward the tread, each bead filler comprising a rubber composition which comprises about 100 parts by weight of a rubber component and from about 15 to 70 parts by weight of short fiber filaments having a mean diameter of less than about 1 μm wherein the material of said short fiber filaments comprises a thermoplastic polymer having an acid amide bond represented by the formula:

said rubber composition being anisotropic such that the modulus of elasticity of the bead filler measured under tension in the circumferential direction of the tire to the extent of about 20% stretch is greater than about 40 kg/cm^2 and is in a range of between about 2.0 and about 6.0 times as high as the modulus of elasticity of said bead filler measured under tension in the radial direction of the tire to the extent of about 20% stretch.

4,711,286

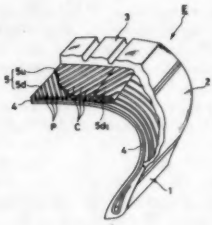
PNEUMATIC RADIAL TIRE FOR PASSENGER CAR

Kazuyuki Kabe, Hiratsuka; Tuneo Morikawa, Hadano, and Shuji Takahashi, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1986, Ser. No. 843,432

Int. Cl.⁴ D02G *3/48;* **B60C** *9/26*

U.S. Cl. 152—527 **7 Claims**



1. In a pneumatic radial tire with improved high speed performance and driving comfortableness for a passenger car of the type which consists of a pair of right and left bead portions, a pair of right and left side wall portions continuing said bead portions, respectively and a tread portion interposed between said side wall portions, and in which a carcass layer having a cord angle in the range of 70° to 90° to a tire circumferential direction is mounted between said bead portions and a plurality of belt layers crossing one another and at cord angles in the range of 10° to 35° to the tire circumferential direction are disposed on said carcass layer at said tread portion, the improvement wherein:

(1) among said belt layers, a belt layer consisting of aromatic polyamide fiber cords is disposed on the side of said carcass layer, and a belt layer consisting of carbon fiber cords is disposed on the side of said tread portion in the proximity of said belt layer on the carcass layer side; and

(2) the end portions of at least one belt layer consisting of the aromatic polyamide fiber cords on the side of said carcass layer are bent so that the bent portions cover the end portions of said belt layer consisting of the carbon fiber cords on the side of said tread portion.

4,711,287

CASTING METHOD

Hideki Kuwabara, Hadano; Masato Naito, Hiratsuka; Teishiro Watanabe, and Tadatsugu Hamada, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Japan Styrene Paper Corporation, both of Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,730

Claims priority, application Japan, Feb. 27, 1985, 60-38511; Feb. 28, 1985, 60-39873; Mar. 19, 1985, 60-53310; Mar. 19, 1985, 60-53311

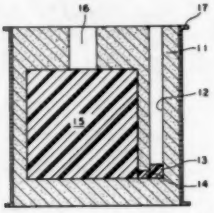
Int. Cl.⁴ B22C *7/02, 9/04*

U.S. Cl. 165—34 **10 Claims**

1. A method of casting, comprising the steps of:

providing a pattern formed of an expanded polyolefin resin

and having a bulk density of 0.025–0.012 g/cm^3, said polyolefin resin being selected from the group consisting of (a) non-crosslinked polypropylene resins which are ethylene-propylene random copolymers having an ethylene content of 0.5–10% by weight and having secondary crystals, (b) crosslinked polypropylene resins which are ethylene-propylene random copolymers having an ethylene content of 1–10% by weight, (c) crosslinked high density polyethylenes having a density of 0.94 g/cm^3 or more and (d) mixtures thereof;



embedding said pattern in a mold body;

forming in said mold body a gating system leading to said embedded pattern; and

pouring in said gating system molten metal for volatizing and replacing said embedded pattern in said mold body.

4,711,288

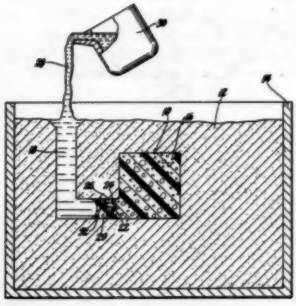
HALIDE TREATMENT FOR ALUMINUM LOST FOAM CASTING PROCESS

Douglas J. Harvey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1987, Ser. No. 10,239

Int. Cl.^{4} B22C *9/04*; B22D *27/00*

U.S. Cl. 164—34 **3 Claims**



1. In a lost foam process for casting aluminum comprising embedding an expendable pattern formed of a thermally decomposable polymeric material into a refractory mold and casting aluminum melt into said mold to progressively decompose and replace the pattern, said melt forming a front adjacent the decomposing pattern, the improvement comprising

incorporating a halide salt flux material within the pattern for dispersion onto said melt front as said front progressively decomposes said pattern, said flux being composed of a halide salt effective to inhibit formation of oxide fold defects in the cast product.

4,711,289

CASTING METHOD AND APPARATUS

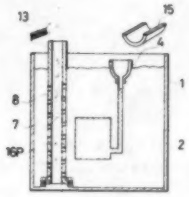
Kunihiko Kanoh, Togura; Kanji Matsuki; Kazuhisa Ohta, both of Nagano, and Tadaomi Sunohara, Kohshoku, all of Japan, assignors to Morikawa Sangyo Kabushiki Kaisha, Nagano, Japan

Filed Mar. 6, 1987, Ser. No. 22,764

Claims priority, application Japan, Mar. 14, 1986, 61-56272; Apr. 2, 1986, 61-49276

Int. Cl.^{4} B22C *9/04*

U.S. Cl. 164—34 **8 Claims**



1. A casting method comprising:

filling a flask with a heat resistant filling material to embed therein a pattern of the type which melts down and generates combustible gas when it is heated, a runner connected to said pattern and provided with a sprue and a hollow venting device having an open upper end and a sidewall provided with at least one vent opening;

pouring a molten metal into said sprue so that said molten metal reaching said pattern through said runner may heat said pattern and cause it to melt down and generate gas, may occupy a cavity formed by the meltdown of said pattern and may drive out said gas into said venting device through said filling material and said vent opening; and

burning said gas at said upper end of said venting device.

3. A casting apparatus comprising:

at least one flask filled with a heat resistant filling material;

a pattern embedded in said filling material and forced from a material which melts down and generates combustible gas when it is heated;

a runner connected to said pattern and provided with a sprue;

a vertically disposed hollow venting device embedded in said filling material and having an open upper end located above said filling material and a sidewall provided with at least one vent opening; and

a device provided adjacent to said upper end of said venting device for igniting said gas.

4,711,290

METHOD AND APPARATUS FOR CASTING IRON TREATED WITH MAGNESIUM

Rolf Rietzscher, Mettmann; Stefan Dersch, Solingen, both of Fed. Rep. of Germany, and Max Riethmann, Ermatingen, Switzerland, assignors to George Fischer Ltd., Schaffhausen, Switzerland

Filed Feb. 18, 1986, Ser. No. 830,104

Claims priority, application Switzerland, Feb. 18, 1985, 735/85

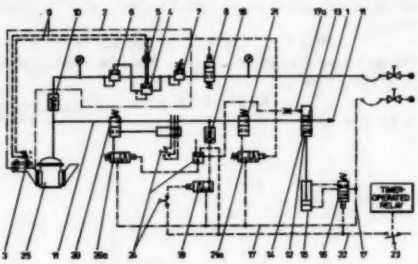
Int. Cl.^{4} B22D *23/00*

U.S. Cl. 164—66.1 **12 Claims**

4. A method of casting iron treated with magnesium in a casting apparatus operated with gas under pressure, the apparatus being of the type having a casting furnace and a piping system for delivering an inert gas under pressure to the casting furnace and wherein inert gas flowing back from the casting furnace is enriched with magnesium, comprising

restricting the backflow of inert gas to a selected, limited portion of the piping system so that magnesium condensing out of the gas is restricted to the selected portion; and

periodically oxidizing condensed magnesium in the selected portion of the piping system without interrupting the casting process by automatically flowing an oxidizing gas



through the selected portion of the piping system and concurrently blocking gas flow between the selected portion and the casting furnace.

4,711,291

A METHOD FOR MAKING A ROLL FOR PROCESSING A WEB OR STRIP OF MATERIAL

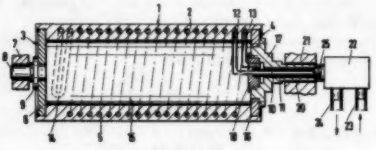
Klaus Reinhold, Lienener Strasse 59, 4540 Lengerich, Fed. Rep. of Germany

Division of Ser. No. 711,866, Mar. 14, 1985, Pat. No. 4,683,627. This application Aug. 28, 1986, Ser. No. 901,487

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 8409106

Int. Cl.[4] B21B *31/08*; B22D *19/00*

U.S. Cl. 164—98 **4 Claims**



1. A method for making a roll used for processing material in the form of a web or strip comprising the steps of forming a metal tube into a spiral, centrifugally casting a metal of distinctly lower melting temperature than that of said spiral tube about said spiral tube and thereby forming a cylindrical hollow body about said spiral tube such that the spiral tube is embedded in the walls of the cylindrical body, shrinking said cylindrical body onto said spiral tube during cooling of the cylindrical body to thereby provide intimate contact between the spiral tube and the cylindrical body and to thereby rigidly embed said spiral tube within the walls of said cylindrical body, and precluding said spiral tube from softening and melting during said centrifugal casting to thereby prevent welding between said spiral tube and said cylindrical body such that the shape and configuration of the spiral tube is retained during the forming of the roll.

4,711,292

CORE AND SHELL SHOOTER

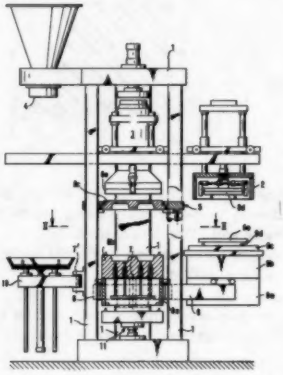
Reiner Rommel, and Werner Landaua, both of Mannheim, Fed. Rep. of Germany, assignors to Adolf Hottinger Giesserei und Maschinenbau GmbH

Continuation of Ser. No. 745,915, Jun. 18, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 37,613

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422687

Int. Cl.[4] B22C *13/08, 13/12, 15/26*

U.S. Cl. 164—200 **1 Claim**



1. A core and shell blowing machine comprising a machine frame, a cope eject device, a blow device, and a related blow-plate removal device, a sand fill assembly, a cope arrestor, a lift device, and a core-box change device consisting of twin core-box supports, characterized in that the core-box change device is arranged to be swung horizontally about a vertical axis, bringing the core-box out of the machine and, simultaneously, a new core-box into the machine above the lift device.

4,711,293

VENTILATOR OF THE HEAT EXCHANGE TYPE

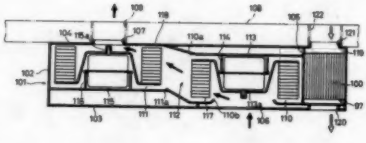
Kiyomi Niwa, and Yutaka Kozawa, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1987, Ser. No. 24,176

Claims priority, application Japan, Aug. 28, 1986, 61-202198; Aug. 29, 1986, 61-203932; Aug. 29, 1986, 61-203933

Int. Cl.[4] F28D *19/00*

U.S. Cl. 165—4 **6 Claims**



6. A ventilator of the heat exchange type comprising:

(a) an air passageway communicating between an interior of a room to be ventilated and the outdoors;

(b) a first centrifugal fan for introducing outdoor air to the interior of the room and a second centrifugal fan for discharging indoor air outdoors, both said first and second centrifugal fans being disposed before and behind within said air passageway in the direction of air flows;

(c) at least any one of said first and second centrifugal fans being formed of a heataccumulative material so that heat contained in the exhaust air is accumulated in said centrifugal fan formed of the heat-accumulative material and

that the heat accumulated therein is dissipated to the suction air; and

(d) means for driving said first and second centrifugal fans alternately.

4,711,294

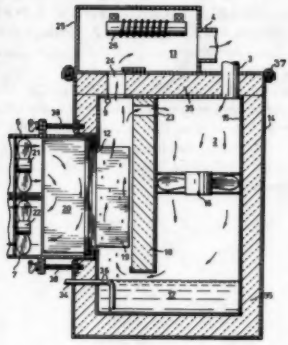
TEMPERATURE AND HUMIDITY CONTROL SYSTEM

Alphonse F. Jacobs, 4271 Longmoor Drive, Burlington, Ontario, Canada L7L 5A4, and James R. Paxton, 162 Manse Road, Scarborough, Ontario, Canada M1E 3V1

Filed Aug. 14, 1985, Ser. No. 765,591

Int. Cl.[4] F24F *3/153*; B01D *47/06*

U.S. Cl. 165—19 **9 Claims**



1. Apparatus for controlling the temperature and humidity of air within an enclosed space comprising:

(a) a thermally insulated chamber;

(b) a water bath at the bottom of said chamber;

(c) a partial wall extending from the top of said chamber to a point near the surface of said water bath dividing said chamber into a first side and a second side;

(d) inlet means to conduct air from said enclosed space to the upper part of said first side of said chamber and outlet means to conduct air from the upper part of the second side of said chamber to said enclosed space;

(e) a fan mounted part-way down said wall on said first side to induce a flow of air down said first side and under said wall and over said water bath;

(f) means in said second side of said chamber to cool said flow of air to a predetermined temperature;

(g) an opening in said wall above said fan permitting a first portion of said flow of air to return from the second side of the chamber to the first side of the chamber;

(h) wherein said outlet means permits a second portion of said flow of air to return to said enclosed space; and

(i) means to heat said second portion of said flow of air to a predetermined temperature.

4,711,295

AIR CONDITIONER SYSTEM FOR AUTOMOBILES

Yoshihiko Sakurai, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 758,963

Claims priority, application Japan, Jul. 25, 1984, 59-154224

Int. Cl.[4] F24F *3/00*

U.S. Cl. 165—22 **3 Claims**

1. An air conditioner system for vehicle including a passenger compartment having a front-seat part and a rear-seat part, said air conditioner system comprising:

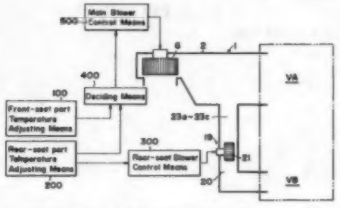
(a) a front-seat air conditioner unit including a main duct, a blower disposed in said main duct for forcing air therethrough to said front-seat part, an evaporator disposed in said main duct and a heater core disposed in said main duct;

(b) a rear-seat blower unit including a rear-seat duct and a rear-seat blower disposed in said rear-seat duct for forcing air therethrough to the rear-seat part;

(c) at least one connecting passage interconnecting said main duct downstream of said main blower and said rear-seat duct upstream of said rear-seat blower;

(d) a means for setting a temperature of said front-seat part;

(e) a means for setting a temperature of said rear-seat part;



(f) a means for controlling said rear-seat blower according to control patterns which are dependant upon at least an output signal of said means for setting a temperature of said rear-seat part;

(g) a means for determining if said set temperature of said means for setting a temperature of said front-seat part and said means for setting temperature of said rear-seat part are at maximum or minimum values;

(h) a means for controlling said main blower according to control patterns which are dependant upon said means for determining.

4,711,296

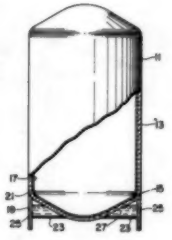
APPARATUS FOR AVOIDING THERMAL STRESSES IN GLASS LINED VESSELS

Erwin J. Nunlist, Penfield, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Nov. 5, 1984, Ser. No. 668,604

Int. Cl.[4] F24H *3/00*; B65D *90/04, 90/06, 90/12*

U.S. Cl. 165—47 **7 Claims**



1. A vertically arranged cylindrical shaped, glass lined vessel comprising:

(a) side and end walls, said side and bottom end walls connected by a knuckle radius;

(b) an annular support skirt attached to said side wall contiguous to said knuckle radius and extending downward from and generally aligned with said side wall beyond the contour of the bottom of said vessel, said support skirt having sufficient dimensional stability to support said vessel in a vertical position;

(c) a bottom plate attached to the inside of said skirt and connecting to the outside of said bottom portion of said vessel forming an enclosed annular heat transfer compartment surrounding said knuckle radius of said vessel; and

(d) a heat transfer medium within said compartment placing the lower portion of said vessel in heat transfer relation to said skirt.

4,711,297

ROTARY TUBE COOLER CONSTRUCTION

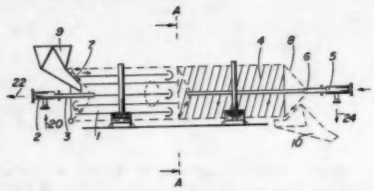
Heinz Haacker, Kreuztal-Ferndorf, and Helmut Wensing, Essen, both of Fed. Rep. of Germany, assignors to MAN Gutehoffnungshutte GmbH, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,745

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534991

Int. Cl.[4] F28D *11/08*

U.S. Cl. 165—88 10 Claims



1. A rotatable heat exchanger drum having a wall formed of a continuous tube arranged in a particular pattern defining a continuous flow path and includes a longitudinally extending tube portion at one end and a spirally extending tube portion at the other end.

4,711,298

HEAT EXCHANGERS MOLDED FROM REFRACTORY MATERIAL

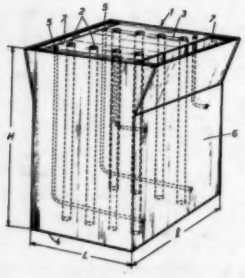
Serge Rogier, Avignon, and Jacques Guigonis, Entraigues Sorgue, both of France, assignors to Societe Europeenne des Produits Refractaires, Courbevoie, France

Continuation of Ser. No. 628,911, Jul. 9, 1984, abandoned. This application Oct. 3, 1986, Ser. No. 914,571

Claims priority, application France, Jul. 11, 1983, 83 11495

Int. Cl.[4] F28D *7/02*

U.S. Cl. 165—165 12 Claims



1. A heat exchanger consisting essentially of a one-piece body of oxide-based refractory material, said body having a plurality of surface portions and comprising a plurality of first tubular, continuous channels for a first fluid extending therethrough and a plurality of second tubular, continuous channels for a second fluid extending therethrough, said first and second channels being distributed within the cross-section of said body in a mutual heat-exchange relationship and having middle portions which are mutually parallel, said first channels having first ends for connection to an inlet of said first fluid and second ends for connection to an outlet of said first fluid, said second channels having first ends for connection to an inlet of said second fluid and second ends for connection to an outlet of said second fluid, at least one of said first and second channels having at least one bend said bend having a radius of curvature,, and said first ends of said first channels, said second ends of said first channels, said first ends of said second channels and said second ends of said second channels opening on different surface portions of said body, said body being molded from an oxide-based refractory casting composition which sets at ambient temperature and exhibits a shrinkage lower than 0.5% upon setting.

4,711,299

APPARATUS AND METHODS FOR PUMPING SOLIDS AND UNDESIRABLE LIQUIDS FROM A WELL BORE

Donald B. Caldwell, Enid, and Robert J. Spring, Oklahoma City, both of Okla., assignors to The Adaptable Tool Company, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 750,050, Jun. 26, 1985, Pat. No. 4,621,693. This application Nov. 10, 1986, Ser. No. 929,397

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] E21B *37/00*

U.S. Cl. 166—105.1 6 Claims

1. An apparatus for removing debris from a well comprising:

an elongate string connectable to a source of reciprocating and rotating motion located at the surface, the string including:

a vertically extending debris-receiving tubing portion having an outlet at the upper end thereof, and an inlet at the lower end thereof;

a debris retaining check valve sub positioned in said elongated string below said vertically extending debris-receiving tubing portion, and including a debris retaining check valve positioned to close said inlet to said debris-receiving tubing portion;

a lower downhole pump in fluid communication with the outlet of said debris-receiving tubing portion and connected to the upper end of said debris-receiving tubing portion, and including a lower pump cylinder, an apertured lower pump piston and a hollow lower pump piston rod, said lower pump piston connected by said hollow lower pump piston rod to the outlet of said debris-receiving tubing, and said lower pump cylinder retained in the string for reciprocation upwardly and downwardly around said apertured lower pump piston, and forming the upper end of said lower downhole pump;

an intermediate check valve sub connected to the upper end of said lower pump cylinder, and vertically reciprocable

with said cylinder, said intermediate check valve sub including a check valve preventing retrograde flow of fluid downwardly into said lower pump cylinder;

an upper downhole pump connected to said intermediate check valve sub above said intermediate check valve sub in said string, and on the opposite side of said intermediate check valve sub from said lower downhole pump, said upper downhole pump including an upper pump cylinder and an apertured upper pump piston and a hollow upper pump piston rod, said apertured upper pump piston being connected by said upper pump hollow piston rod to the upper end of said intermediate check valve sub, and said upper pump cylinder being retained in the string for reciprocation upwardly and downwardly around said apertured upper pump piston, and forming the upper end of said upper downhole pump;

an upper portion of said string communicating with said upper downhole pump and connectable to said surface-located source of reciprocating and rotating motion on one end, and to said upper downhole pump cylinder on the other end, said upper pump cylinder being keyed to said hollow upper pump piston rod to communicate the rotation motion of said upper portion of said string via said hollow upper pump piston rod, and via said lower pump cylinder and via said lower pump piston rod keyed to said lower pump cylinder to said debris-receiving tubing located below said upper downhole pump and below said lower downhole pump;

said lower pump piston rod and lower pump piston including an internal passageway open and unobstructed from one end to the other thereof and establishing fluid communication between said lower pump cylinder and said debris retaining portion;

said hollow upper pump piston rod and apertured upper pump piston including an internal passageway open and unobstructed from one end to the other and establishing fluid communication between said upper pump cylinder and, through said intermediate check valve sub, with said lower pump cylinder of said lower downhole pump; and

an upper check valve sub located above said upper downhole pump and connected to said upper pump cylinder and to said upper portion of said string for permitting flow of fluid through said last-mentioned internal passageway and through said upper pump cylinder into said upper portion of said string at a location above said upper check valve sub, and to prevent fluid flow in the reverse direction.

4,711,300

DOWNHOLE CEMENTING TOOL ASSEMBLY

Louis J. Wardlaw, III, P.O. Box 219061, Houston, Tex. 77218, and Joe A. Young, 100 Bastrap St., Lafayette, La. 70583

Filed May 14, 1986, Ser. No. 863,239
Int. Cl.[4] E21B *33/16*
U.S. Cl. 166—153 **6 Claims**

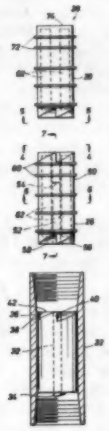
1. A cementing apparatus for use in cemeting a casing string in a well bore, comprising:

(a) a float collar incorporated in the casing string, said float collar including a passage extending therethrough;

(b) a cementing plug having a cylindrical body including an axial passage extending therethrough, said cementing plug body further including closure means extending across said axial passage;

(c) a wiper plug having a cylindrical body including wiper means extending about said wiper plug body for wiping the casing as said wiper plug is advanced through the casing;

(d) cooperative interlocking means located on said float collar, said cementing plug and said wiper plug for locking said cementing plug and said wiper plug to said float collar in a nonrotatable position; and



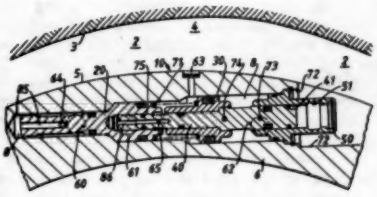
(e) wherein said cementing plug and said wiper plug including frangible internal cutters embedded in said cementing plug and said wiper plug.

4,711,301

VALVE ASSEMBLY FOR INFLATABLE PACKER

William D. Stringfellow, Houston, Tex., assignor to Weatherford U.S., Inc., Houston, Tex.

Filed Sep. 5, 1985, Ser. No. 773,410
Int. Cl.[4] E21B *33/127*
U.S. Cl. 166—187 **33 Claims**



1. A valve assembly for controlling the flow of fluid from within casing into a bladder element of an inflatable packer for use in a wellbore, the bladder element having bladder port means, the valve assembly mountable within a single cavity in a body member in the wall of casing or a casing coupling, the body member having casing port means communicating with the cavity for communicating casing fluid to the bladder port means so that the casing fluid can flow through the bladder port means to inflate the bladder element and the body member having overpressure port means communicating with the cavity for communicating part of the fluid flowing into the bladder element back to the cavity and to the valve assembly,

the valve assembly comprising

control piston means movably mounted within the cavity, the control piston means movable from a first position in which the control piston means closes off the casing port means and the bladder port means to the flow of casing fluid, to a second position in which casing fluid flows through the casing port means and bladder port means into the bladder element,

restraint means for insuring that the control piston means

initially moves only when the pressure of the casing fluid reaches a predetermined level, and

closing piston means movably mounted within the cavity and responsive to the pressure of the fluid in the bladder element, a portion of the fluid in the bladder element communicating with the closing piston means through the overpressure port means, so that when the pressure of the fluid in the bladder element reaches a predetermined level the closing piston means moves to contact and push the control piston means back into the first position, closing off the casing port means and sealing the casing fluid within the casing and closing off the bladder port means thereby maintaining the pressure of the fluid in the bladder element, and

the control piston means and the closing piston movable about stem means disposed in the cavity.

4,711,302

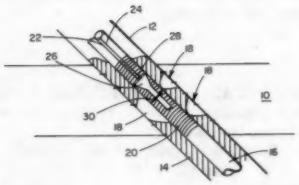
GRAVEL PACK VOID SPACE REMOVAL VIA HIGH ENERGY IMPULSE

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,466

Int. Cl.[4] E21B *43/04, 43/00, 47/10*

U.S. Cl. 166—250 **26 Claims**



8. A high energy impulse method for removing voids in an in-casing gravel pack used in producing hydrocarbonaceous fluids from a subterranean formation via a deviated wellbore comprising:

(a) placing within a well, a high energy impulse device in proximity to a void containing in-casing gravel pack which encompasses a perforated production string;

(b) igniting said device which device upon ignition generates energy sufficient to cause turbulence within said gravel pack sufficient to consolidate gravel within said pack and remove voids therefrom without fracturing the formation, damaging the pack or production string assembly;

(c) determining the existence of an additional void in said pack; and

(d) repeating steps (a), (b) and (c) until all voids are removed from said pack, thereby consolidating said pack and preventing fines from accumulating in a void.

4,711,303

METHOD AND MEANS FOR DETERMINING THE SUBSURFACE POSITION OF A BLOWING WELL WITH RESPECT TO A RELIEF WELL

Thijs Koeling; Bernd C. Lehr, and Willem Broekhuizen, all of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1984, Ser. No. 654,579

Claims priority, application United Kingdom, Oct. 11, 1983, 8327178

Int. Cl.[4] E21B *47/00;* **G01V** *1/40*

U.S. Cl. 166—250 **14 Claims**

1. A method for determining the subsurface position of a blowing well with respect to a relief well, said method comprising:

detecting at a plurality of axially spaced locations along the longitudinal axis of the relief well acoustic waves emanating from a subsurface location in the blowing well;

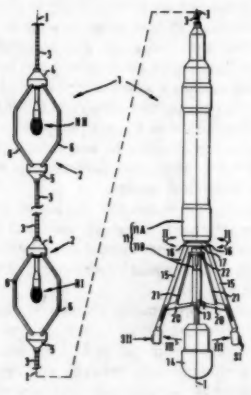
determining the difference in the times of arrival of said acoustic waves at said axially spaced locations;

detecting said acoustic waves at a first plurality of circumferentially spaced first locations at a predetermined axial location along the wall of said relief well, the plane of said circumferentially spaced locations being substantially normal to the axis of said relief well;

measuring the intensity of the acoustic waves arriving at said circumferentially spaced first locations;

subsequently again detecting said acoustic waves at a second plurality of circumferentially spaced second locations substantially at said predetermined axial location and located at positions rotated along the wall of said relief well from said first locations;

measuring the intensity of the acoustic waves arriving at said circumferentially spaced second locations; and



using said time difference and intensity measurements to compute the distance and azimuth between said relief well and said blowing well.

6. An apparatus for determining the subsurface position of a blowing well with respect to a relief well, comprising:

an array of acoustic receivers carried by an elongate support, the receivers being disposed at predetermined intervals along the longitudinal axis of the support;

a frame carrying an assembly of acoustic sensors, said sensors being disposed so that each sensor is movable in a substantially radial direction with respect to a central axis of the frame;

means rotatably attaching at least a portion of said frame to said elongate support for rotating at least said sensors, relative to said support, substantially on said longitudinal axis of said support; and

means for measuring the angular displacement of said sensors relative to said support.

4,711,304

METHOD OF AND APPARATUS FOR INJECTION OF STEAM INTO MULTIPLE WELL ZONES

Eric J. Boeke, and Milton E. McCoy, both of Bakersfield, Calif., assignors to Camco, Incorporated, Houston, Tex.

Filed Dec. 15, 1986, Ser. No. 941,671

Int. Cl.[4] E21B *36/00, 43/24*

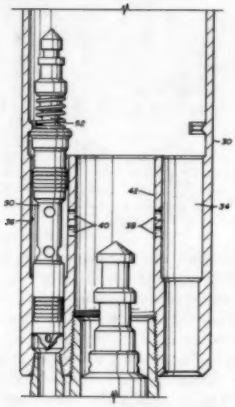
U.S. Cl. 166—303 **10 Claims**

1. Apparatus for injection of steam containing water into first and second separated well zones comprising;

a weld tubing in a well extending through first and second well zones,

a mandrel connected in the well tubing, said mandrel including an open bore, first and second sidepockets offset from

the open bore, flow passageways communicating between the open bore and each of the sidepockets, said passageways to each of the sidepockets being at substantially the same elevation, a flow control device positioned in at least one of the sidepockets, plug means in the open bore below the passageways for collecting any water injected into the tubing for allowing the water to build up and flow into both of the passageways, an exit port connected to one of the sidepockets and in communication with the first well zone and an exit port connected to the second of the sidepockets and in communication with the second well zone.



8. The method of injecting steam containing water into first and second separated well zones comprising,

injecting the steam containing water down the bore of a single well tubing,

directing the steam into two different paths offset from the bore,

directing one path into the first well zone,

directing the other path into the second well zone,

collecting any water in the bore of the well tubing, and

directing substantially equal portions of the water into the two paths thereby substantially equalizing the water injected into the separated well zones.

4,711,305

MULTI-MODE TESTING TOOL AND METHOD OF TESTING

Paul D. Ringgenberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 596,321, Apr. 3, 1984, Pat. No. 4,633,952. This application Dec. 31, 1986, Ser. No. 948,340

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] E21B *49/08, 34/10*

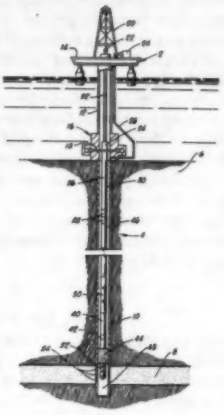
U.S. Cl. 166—336 **9 Claims**

1. A tool for use in a testing string disposed in a well bore, comprising:

tubular housing means defining a longitudinal tool bore;

valve menas including a tool bore closure valve disposed in said housing means;

operating means, including mandrel means, adapted to selectively open and close said tool bore closure valve in response to sequential changes in pressure proximate said tool in said well bore; and



ratchet means associated with said mandrel operating means or controlling said selective opening and closure of said tool bore closure means pursuant to a program.

4,711,306

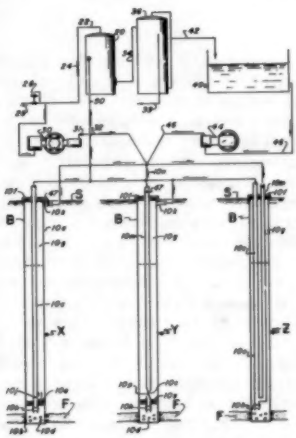
GAS LIFT SYSTEM

Roy A. Bobo, 3636 W. T.C. Jester, Suite B, Houston, Tex. 77018

Continuation-in-part of Ser. No. 631,059, Jul. 16, 1984, abandoned. This application Sep. 16, 1986, Ser. No. 908,106

Int. Cl.[4] E21B *43/00*

U.S. Cl. 166—372 **10 Claims**



1. A gas lift method for lifting fluid from a borehole to the surface, comprising the steps of:

mixing at the surface a pressurized injection gas with a presssurized injetion liquid without any foaming substance to form a gas-liquid pressurized non-foam mixture at a predetermined pressure less than the pressure at the bottom of the borehole; said gas having a different composition than said liquid;

introducing said pressurized mixture into a first elongate portion of said borehole substantially at said predetermined pressure and flowing the mixture to a point down in the borehole to cause the gas to become gradually com-

pressed more and more as the height of the gas-liquid column thereabove increases;

then flowing the non-foam gas-liquid mixture at said point into a second elongate portion of the borehole which communicates with the surface to allow the gas to then gradually expand in and displace said well fluid upwardly towards the upper end of said borehole, thereby reducing the density of the well fluid in the second elongate portion and lowering the bottom hole pressure in the well; and

continuing the flow of the gas-liquid mixture into the first elongate portion to cause the continuing flow into the second elongate portion of said borehole with further lowering of bottom hole pressure and resultant flow of said well fluid to the surface from the well bore through said second elongate portion with resultant stabilization of the bottom hole pressure.

4,711,307

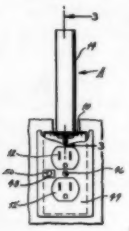
COMPACT SELF-CONTAINED FIRE EXTINGUISHER

Harold Rosen, 3 Morwood, St. Louis, Mo. 63141

Continuation of Ser. No. 735,835, May 20, 1985, abandoned. This application Feb. 5, 1987, Ser. No. 15,528

Int. Cl.[4] A62C *35/02*

U.S. Cl. 169—57 **11 Claims**



1. In combination with electrical equipment including a housing of limited space having a knock-out aperture and an interior surface surrounding the knock-out aperture, a compact, self-contained fire extinguisher for installment in the electrical equipment by mounting within the knock-out aperture characterized by the extinguisher comprising an elongated cylindrical vessel having a relatively high aspect ratio and having a diameter which at any point along the length of the vessel is less than the diameter of the knock-out aperature whereby the vessel is configured for extending through the knock-out aperture, the vessel containing a quantity of fire extinguishing substance under pressure, a nozzle at one end of the extinguishing substance under pressure, a nozzle at one end of the elongated vessel, thermally activatable means carried by the nozzle for permitting discharge of the fire extinguishing substance through the nozzle when thermally activated, the vessel being inserted in the knock-out aperture by extension of its nozzle-remote end through the knock-out aperture by extension of its nozzle-remote end through the knock-out aperture, and adhesive securement means including flange-defining structure at a nozzle end of the vessel for providing a securement flange presenting a securement surface of annular configuration and adhesively affixed to the securement surface for adhesively removably mounting the vessel by adhesion to the interior surface of the electrical housing surrounding the knock-out aperture with the nozzle-remote end is extending exteriorly of the electrical housing and with only the nozzle, thermally activatable means and adhesive securement means extending interiorly of the electrical housing for causing discharge of the fire extinguishing substance within the electrical housing, whereby the fire extinguishing apparatus is installable and removable solely from interiorly of the electrical housing.

4,711,308

HAND-HELD TOOL WITH VIBRATION DAMPENING

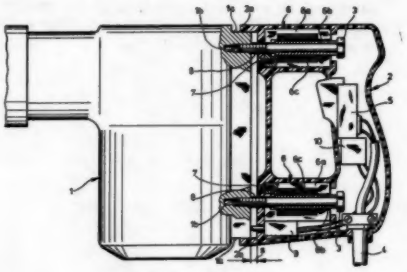
Karl Blaas, Buchs, Switzerland, and Hanajorg Nipp, Mauren, Liechtenstein, assignors to Hilti Aktiengesellschaft

Filed Jun. 13, 1986, Ser. No. 873,971

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521808

Int. Cl.[4] E21B *3/00*

U.S. Cl. 173—162 R **8 Claims**



1. A hand-held tool used as a hammer drill, a chipping hammer or the like, comprising a housing having a first end and a second end disposed in spaced relation, a driving unit in said housing supplying the driving force with the driving force acting in the direction from the second end toward the first end of said housing and generating vibrations acting along a main vibration axis extending in the direction between the second and first ends of said housing, a handle mounted on the second end of said housing and being displaceably supported in the direction of the main vibration axis between two stops spaced apart in the direction of the main vibration axis, wherein the improvement comprises that said two stops comprises a first stop means on said housing in the region of the second end of said housing for limiting movement of said handle toward said housing and a second stop means within said handle spaced in the main vibration axis direction from said housing for limiting movement of said handle away from said housing, and an electromagnet located within said handle between said first and second stop means and exerting a force acting counter to the driving force of said driving unit, and means are provided for maintaining the force of said electromagnet constant within a portion of the entire displaceable movement of said handle.

4,711,309

DRILLING APPARATUS

Robert G. Knight, Stoke Golding; Samir R. Klat, Burwood Park, and Kenneth Unwin, Moira, all of England, assignors to Nytol Enterprises Limited, Channel Islands

Continuation-in-part of Ser. No. 771,710, Sep. 3, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 879,525

Claims priority, application United Kingdom, Jul. 20, 1985, 8518366; Feb. 19, 1986, 8604110

Int. Cl.[4] E21B *4/02*

U.S. Cl. 175—93 **13 Claims**

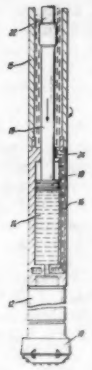
1. A hole forming apparatus, comprising:

(a) a bit assembly adapted to be driven from the surface in a plurality of modes, including by a pressurized fluid;

(b) a fluid pressurizing apparatus located adjacent the bit assembly and having a fluid connection therewith for supplying pressurized fluid for driving the bit assembly in the said one mode, the fluid pressurizing means and the bit assembly forming a closed hydraulic circuit operable without fluid being pumped from the surface;

(c) first drive means mechanically driving the fluid pressurizing means; and

(d) second drive means operable to drive the bit assembly in a second mode independent of the first drive means, said



first drive means being controllable at the surface independently of said second drive means.

4,711,310

ROTARY HEAD

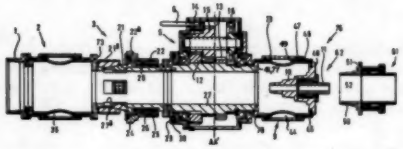
Lam M. Luen, 5000 Marine Parade Road, Laguna Park, Blk.G 04-27, Singapore-1544, Singapore

Filed Nov. 1, 1985, Ser. No. 794,017

Claims priority, application United Kingdom, Jan. 4, 1985, 8500190; Jul. 15, 1985, 8517815

Int. Cl.[4] E21B *3/02, 21/12*

U.S. Cl. 175—171 **15 Claims**



1. A rotary head for a drilling machine, said rotary head comprising:

means for engaging a plurality of drilling means, said engaging means including upper, intermediate and lower engaging means spaced apart on said rotary head for each engaging one or more drilling means, said upper engaging means including at least one adapter for connecting said drilling means to said rotary head, each adapter being provided with an aperture for supplying flushing liquid to or from said drilling means engaged by said engaging means, said at least one adapter includes a plurality of adapter sections, said adapter sections being of different cross-sectional areas so that said cross-sectional area of said adapter decreases in a step-wise manner, each adapter section having a surface formed with a screw-thread for engaging a screw-threaded end of said drilling means, wherein at least three adapter sections are provided and said screw-thread of at least two adjacent adapter sections extend in opposite directions;

means for rotating said drilling means engaged by said engaging means at a speed which is adjustable; and

flushing means including a plurality of flushing inlet apertures for supplying flushing fluid to or from said drilling means engaged by said engaging means, said flushing means including three flushing apertures flushing fluid to or from drilling tools engaged by said engaging means.

4,711,311

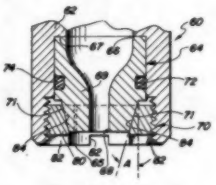
VIBRATION AND EROSION RESISTANT NOZZLE

Lance D. Underwood, Mission Viejo, Calif., and Michael S. Oliver, Lafayette, La., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 20, 1986, Ser. No. 933,407

Int. Cl.[4] E21B *10/18*

U.S. Cl. 175—340 **10 Claims**



1. An erosion and vibration resistant nozzle retention apparatus for earth boring rock bits comprising:

a rock bit body, said body forming a first pin end and a second cutting end, said body further forming an interior cavity that communicates with the interior of a drill string that is attachable to said first pin end of said rock bit body, said body further forms at least one nozzle cavity for directing fluid therethrough;

a nozzle body forming a first entrance end and a second exit end adapted to be inserted within said nozzle cavity, said nozzle body at said second exit end forms a conical section exteriorly of said nozzle; and

a nozzle retainer adapted to be threaded into complementary threads formed by said rock bit body adjacent said nozzle cavity, said retainer forming means therein to engage said nozzle body, said means to engage said body is a conically shaped interior portion formed by said retainer that substantially parallels said conically shaped exterior of said exit end of said nozzle body, said retainer further having means formed thereby to more tightly engage the roots and crests of said threads in said body adjacent said nozzle cavity, and to inhibit vibration and erosion of said retainer and nozzle body during rock bit operation.

8. A method to resist erosion and vibration of a nozzle and nozzle retention device for earth boring rock bits comprising the steps of:

forming a rock bit body, said body forming a first pin end and a second cutting end, said body further forming an interior cavity that communicates with the interior of a drill string, said body forming at least one nozzle cavity for directing fluid therethrough;

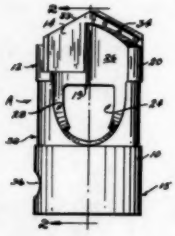
forming a nozzle body that is adapted to be inserted within said nozzle cavity, said nozzle body having means formed in the exterior wall of said nozzle body to accept a nozzle retainer, said means formed in the exterior wall of said nozzle is a conical section formed nearest an exit end of said nozzle; and

forming a nozzle retainer adapted to be threaded into complementary threads formed by said rock bit body adjacent said nozzle cavity, said nozzle retainer forms a complementary conical section on an interior of said retainer adapted to engage said conical section of said nozzle body, said retainer further forming means adjacent said threads to more tightly engage the roots and crests of said threads in said body adjacent said nozzle cavity.

4,711,312
DRILL BIT

Donald L. Leibee, and Owen K. Crist, both of Bedford, Pa., assignors to The Marmon Group, Inc., Chicago, Ill.

Filed Jul. 22, 1986, Ser. No. 888,302
Int. Cl.[4] E21B *10/60*
U.S. Cl. 175—393 5 Claims

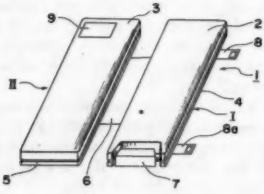


1. A drill bit for use in combination with a through-the-steel drill stem, said drill bit including a drill tip and comprising a body portion having a head portion for receiving said drill tip, a lower portion, a bore through which cuttings may be removed to the drill stem, and drill ports comprising opposed axially extending openings contoured as a hemisphere with respect to said head portion and the periphery of said body portion and opening to said bore from said drill tip and extending axially along said body portion and opening from the periphery thereof to said bore below said head portion thereof.

4,711,313
FOLDABLE WEIGHING SCALE

Hiroyuki Iida, Fujiidera; Haruhiko Murakami, Hirakata; Tsuyoshi Matsumoto, and Junzo Kashihara, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1986, Ser. No. 943,126
Claims priority, application Japan, Dec. 19, 1985, 60-196279[U]; Feb. 19, 1986, 61-36411; Feb. 26, 1986, 61-42560; Sep. 5, 1986, 61-210360; Sep. 30, 1986, 61-233857; Sep. 30, 1986, 61-233858; Oct. 6, 1986, 61-238519; Oct. 8, 1986, 61-239893
Int. Cl.[4] G01G *21/28, 3/14*
U.S. Cl. 177—127 16 Claims

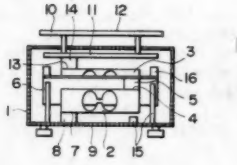


1. A foldable, strain gauge type weighing scale comprising:
a pair of scale components generally identical in construction and shape, the pair of scale components being hingedly connected together for movement between folded and unfolded positions;
hingedly connecting means for connecting the scale components for movement between the folded and unfolded positions;
means for electrically connecting the pair of scale components; and
a display unit;
each of said scale components including
a base,
a platform disposed above the base for relative movement both towards and away from the base,
a strain inducing plate accommodated in a space delimited by the base and the platform, and supported at its opposite ends for deformation in a direction perpendicular to the strain inducing plate when a load is exteriorly applied thereto through the platform, and
at least one strain gauge mounted on the strain inducing plate;
said display unit being electrically connected with the strain gauges in the respective scale components for converting respective output signals from these strain gauges into a weight signal and for displaying information represented by the weight signal, and said means for electrically connecting being for connecting the strain gauges.

4,711,314
MULTI-RANGE LOAD CELL WEIGHING SCALE

Seiji Suzuki; Yoshihisa Nishiyama, and Tohru Kitagawa, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 767,781, Aug. 20, 1985, abandoned.
This application Dec. 24, 1986, Ser. No. 946,123
Claims priority, application Japan, Aug. 20, 1984, 59-173050
Int. Cl.[4] G01G *23/14, 3/14*
U.S. Cl. 177—164 3 Claims



1. A multi-range load cell weighing scale comprising:
a casing having a top and a bottom which defines a base;
a load receiving pan provided at said top of said casing;
a high-range load cell disposed in said casing for a high range of weight determination;
a low-range load cell disposed in said casing for a low range of weight determination said low-range load cell being parallel to said high-range load cell in a horizontal direction, and overlapping said high-range load cell in a vertical direction, said low-range load cell having one end connected to one end of said high range load cell, another end of one of said load cells remote from said one end thereof being supported on said base, while another end of the other load cell defines a load support on which said pan is supported; and
a frame for connecting said one end of said low-range load cell to said one end of said high-range load cell in a stepped fashion, and a plurality of stop members provided below said connecting frame.

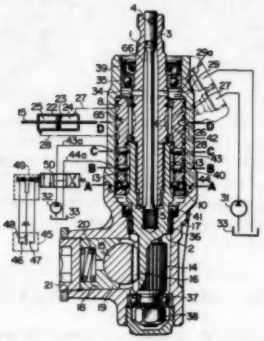
4,711,315
VEHICLE CAR STEERING SYSTEM

Tomimasa Kitamura, Kashihara, Japan, assignor to Koyo Auto-Mech Co., Ltd., Nara, Japan

Filed Oct. 20, 1986, Ser. No. 921,347
Claims priority, application Japan, Oct. 19, 1985, 60-234076
Int. Cl.[4] B62D *5/083*
U.S. Cl. 180—132 6 Claims

1. A power assisted vehicle steering system including an input member connected with a manually operated steering member, an output member connected with a vehicle steering mechanism for transmitting a manual steering force to said vehicle steering mechanism to produce a steering movement in the vehicle steering mechanism, a torsion bar connecting the

input member with the output member, a power assist cylinder provided in said vehicle steering mechanism, valve means having valve port means responsive to a relative displacement between the input member and the output member for producing a supply of hydraulic pressure to the power assist cylinder in a direction of assisting the steering movement of the vehicle steering mechanism when the relative displacement is produced between the input member and the output member as a result of a twist of the torsion bar, the improvement comprising the fact that said valve means includes a valve member means connected with said output member for selective positioning

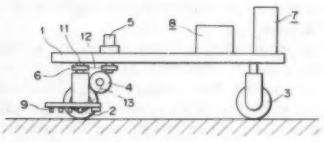


with respect to the output member to one of a neutral position wherein the valve port means is positioned at a neutral position, a first position wherein the valve port means is offset in one direction from the neutral position so that said power assist cylinder is hydraulically biased in a first direction and a second position wherein the valve port means is offset in the other direction from the neutral position so that the power assist cylinder is biased in a second direction, means for holding the valve port means in said first position when the vehicle steering mechanism is steered in the second direction and holding the valve port means in the second position when the vehicle steering mechanism is steered in said first direction.

4,711,316
GUIDANCE SYSTEM FOR UNMANNED TRANSPORTING VEHICLE

Yukio Katou; Takehiro Suzuki, both of Tokyo, and Susumu Shimada, Kitamoto, all of Japan, assignors to Japan Tobacco, Inc., Japan

Filed Sep. 23, 1986, Ser. No. 910,833
Claims priority, application Japan, Sep. 24, 1985, 60-208873
Int. Cl.[4] B62B *1/02*
U.S. Cl. 180—168 **12 Claims**

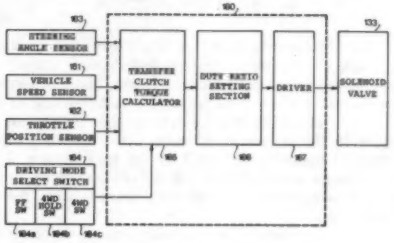


1. A guidance system for an unmanned transporting vehicle which runs along a guide track comprising a belt-shaped light-reflective guide track laid out on a floor or the like, said belt-shaped light-reflective guide track having a predetermined width: and at least one unmanned transporting vehicle including body means; front wheel means and rear wheel means mounted to said body means; drive means for driving at least one of said front wheel means and rear wheel means; a steering mechanism for causing said front wheel means to swivel rightward and leftward; a plurality of photodetectors mounted to said body means forwardly of said front wheel means and longitudinally arranged in a right-hand row and a left-hand row above a said belt-shaped light-reflective guide track, said photodetectors including plural pairs of photodetectors, each pair including a right-hand photodetector and a left hand photodetector, said right-hand and left-hand photodetectors being positioned with a spacing less than said predetermined width, said right-hand photodetector having a light projecting element set to project light onto the belt-shaped light reflective guide track and a light receiving element to receive the light reflected thereby for detection of the guide track, said left hand photodetectors having a light projecting element set to project light onto said guide track and a light receiving element to receive the light reflected thereby for detection of the guide track; control means for controlling said steering mechanism such that said front wheel means is caused to swivel leftward when photodetectors in the right-hand row fail to detect the guide track whereas said front wheel means is caused to swivel rightward when photodetectors in the left-hand row fail to detect the guide track, the degree of said swivelling of the front wheel means being substantially in proportion to the number of photodetectors which fail to detect the guide track.

4,711,317
SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,989
Claims priority, application Japan, Apr. 30, 1985, 60-92974
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—197 **12 Claims**



1. A control system for a tranfer clutch of a four-wheel drive vehicle having an engine having a crank shaft, a transmission having an input shaft, and a main clutch operatively connected to the crank shaft of the engine and to the input shaft of the transmission for transmitting output of the engine to the transmission, the transmission being connected to transmit the output of the engine to main drive axles of the vehicle through a final reduction device, and to an auxiliary drive shaft through the transfer clutch, the system comprising

a vehicle speed sensor for detecting vehicle speed and for producing a variable speed signal dependent on the vehicle speed,

a steering angle sensor for detecting steering angle of the vehicle and for producing a variable steering angle signal dependent on the steering angle,

engine load detector means for detecting engine load and for producing a variable engine load signal dependent on engine load,

means for determining torque capacity of the transfer clutch in response to the vehicle speed signal and the steering angle signal, and for producing a determined torque capacity signal,

correcting mean for correcting the torque capacity of the transfer clutch in response to the engine load signal and

the determined torque capacity signal, and for producing a corrected torque capacity signal,

control means for continuously controlling the torque capacity of the transfer clutch to a proper value dependent on the corrected torque capacity signal so as to prevent tight corner braking while keeping four-wheel driving of the vehicle.

4,711,318

SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

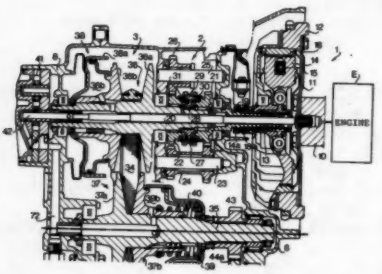
Nobumitsu Kitade, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 856,000

Claims priority, application Japan, Apr. 30, 1985, 60-92975; Apr. 30, 1985, 60-92978

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—247 **8 Claims**



1. A control system for a four-wheel drive vehicle having an engine, a transmission having a first driving range of small transmission ratios and a second driving range of large transmission ratios, a selecting device for selecting one of driving ranges, an engine clutch for transmitting the output of the engine to the transmission, main drive wheels operatively connected to an output shaft of the transmission, auxiliary drive wheels, and a transfer clutch for transmitting the output of the transmission to the auxiliary drive wheels, the system comprising:

first detector means for detecting conditions of the engine clutch and for producing a clutch condition signal representing a clutch condition;

second detector means for detecting a selected driving range as a driving condition of the vehicle and for producing a driving condition driving range signal dependent on the selected driving range; and

means responsive to the clutch condition signal and to the driving range signal for controlling torque capacity of the transfer clutch so as to slip the transfer clutch in dependency on the clutch condition.

4,711,319

SAW HORSE

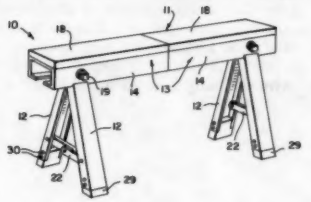
Carmelo Sansotta, 10 Starr Rd., East Brunswick, N.J. 08816, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Dec. 19, 1986, Ser. No. 943,631

Int. Cl.⁴ B27B *21/00*

U.S. Cl. 182—155 **3 Claims**

1. A sawhorse, comprising in combination, a backbone assembly and a plurality of four legs for supporting said backbone assembly elevated above ground or other supporting surface, means for said legs being longitudinally pivotable between a downward operative position and a stored away position inside said backbone assembly, and means for said sawhorse to stand up without wobbling upon any uneven said ground or other supporting surface, wherein the first said means includes each pair of said legs being longitudinally pivotable on a transverse shaft near each opposite end of said assembly, a brace between said legs so to spread a lower end thereof when in said operative position, in combination with means for also pivoting said pair of legs transversely, wherein



said means to prevent wobbling comprises said assembly being made of two channels with ends pivotally secured together at one end thereof so to form two groups of three point supports for said sawhorse, further including resilient means for biasing said pairs of legs towards each other thereby centering and stabilizing said legs in said operative position.

4,711,320

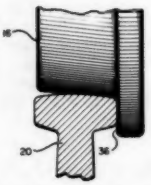
WHEEL FLANGE AND RAIL LUBRICATOR APPARATUS

Robert M. Dombroski, McFarland, and John P. Kayser, Madison, both of Wis., assignors to Madison-Kipp Corporation, Madison, Wis.

Filed Oct. 8, 1985, Ser. No. 785,571

Int. Cl.⁴ B61K *3/00*; F01M *5/00*

U.S. Cl. 184—3.2 **5 Claims**



1. Lubricating apparatus for automatically lubricating the frictional contact area between a locomotive wheel flange and rail during operation of the locomotive comprising:

a source of lubricant;

a lubrication nozzle mounted adjacent said wheel flange and coupled to the lubricant source for directing shots of lubricant in a thin, coherent stream to the frictional contact area between the wheel flange and rail;

distance sensing means for sensing the distance traveled by the locomotive;

a lubrication controller including means for selecting and presetting a distance interval, D, to be traveled by the locomotive between lubrication cycles, L, said controller connected to the lubrication nozzle for controlling the application of said shots of lubricant for said preset distance interval, D, traveled by the locomotive;

said controller responding to the distance sending means and the preset distance, D, for actuating a corresponding lubricant cycle, L, during which said shots of lubricant are applied from the nozzle to said frictional contact area;

said controller including preset lube amount means to preset the amount of lubricant applied during the lubrication cycle, L;

said preset lube amount means includes lube duration preset means for selecting and presetting a lube time duration, Q, within the lubrication cycle, L, with the lube duration, Q,

corresponding to a precise, predetermined amount of lubricant;

wherein said preset lube amount means further includes lube viscosity adjustment means, VIS, for selecting and presetting an adjustment in the lube time duration, Q, to compensate for the viscosity of the lubricant in the lubrication source; and,

temperature sensing means for sensing the ambient temperature and providing a corresponding output signal, wherein said preset lube amount means further includes temperature adjustment means with preset temperature levels, T, responsive to said sensed temperature output signal for selecting and presetting an adjustment in the lube time duration, Q, to compensate for the ambient air temperature acting on the lubricant.

4,711,321

DEVICE FOR METERING LIQUID MEDIA, PARTICULARLY LUBRICANTS

Bo Hedlund, P.O. Box 5011, S-826 05 Söderhamn, Sweden

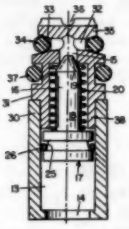
PCT No. PCT/SE85/00488, § 371 Date Jul. 7, 1986, § 102(e) Date Jul. 7, 1986, PCT Pub. No. WO86/03290, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 27, 1985, Ser. No. 882,882

Claims priority, application Sweden, Nov. 28, 1984, 8406002

Int. Cl.[4] G01F *11/04;* **F16N** *27/00;* **F16K** *21/16*

U.S. Cl. 184—7.4 **7 Claims**



1. Device for metering liquid media, particularly lubricants, comprising a plunger body (16) acting between an inlet (14) and an outlet (15) in a chamber (13) being circular in section, said body having on one hand a suitably conical closing part (19) with the purpose to block the outlet (15) when the plunger body (16) is moved to an forward end position, and on the other hand having a piston or piston-shaped part (17,17') with a diameter that is at least somewhat smaller than the diameter of the chamber (13), so that a gap is formed between the outside of the piston and the inside of a housing (12,30,30',30'') confining the chamber, said medium being able to pass through said gap in order charge the space between the piston and the outlet (15) when the plunger body (16), suitably by means of a spring (20), is being returned to a backward end or starting position, a sealing ring (26), placed in the area of the periphery of the piston (17), being arranged to cooperate with a conically narrowing surface (25,25',44) in a way that said sealing ring is brought closer to said conically narrowing surface, (25) when the plunger body (16) is moved in the direction towards the outlet (15), in order to seal or close said gap and in that way render a backflow of the medium past the piston impossible, and on the other hand being distanced from the conically narrowing surface (25) and allowing free passage for the medium past the piston when the plunger body (16) is moved in the direction towards the inlet (14), characterized in, that the sealing ring (26,26',26'') is at least lightly pressed or clamped against a cylindrical surface (13,17') opposing the conically narrowing surface (25,25',44) in order to, in an uninfluenced condition and by means of friction, be retained in a given position in relation to said cylindrical surface.

4,711,322

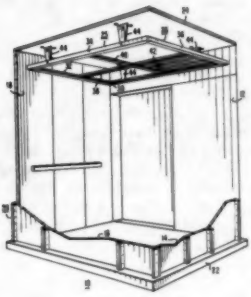
ELEVATOR CAB

Karl B. Orndorff, Bonneauville Boro, and Paul L. Baldwin, Franklin Township, Adams County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1986, Ser. No. 863,482

Int. Cl.[4] B66B *11/02;* **E04B** *5/52*

U.S. Cl. 187—1 R **4 Claims**



1. An elevator cab, comprising:

a canopy,

sidewalls supporting said canopy,

said canopy having lower and upper major, flat surfaces, and first openings which extend between said lower and upper flat surfaces,

a frame for supporting drop ceiling panels,

and hanger straps which support said frame below said canopy,

each of said hanger straps being formed from a single flat sheet of metal, with each hanger strap having flat major sides disposed in parallel planes, to define an elongated, flat, single-piece metallic member having first and second ends, with the metal of each hanger strap extending continuously between said first and second ends,

said second end of each hanger strap terminating in a substantially T-shaped portion having a relatively narrow stem which supports first and second lateral tab portions,

means pivotally attaching the first end of each hanger strap to said frame,

each of said hanger straps being pivotable about said frame-fastened first end, from a relatively flat, low profile shipping position, to an extended operating position,

said first and second lateral tab portions at the second end of each hanger strap, with the hanger strap in its operative position, extending through one of said first openings in said canopy, with the metal which defines said first and second lateral tab portions being bent such that the first and second lateral tab portions are not in the parallel planes of the flat major sides of the associated hanger strap, said bent first and second lateral tab portions being adjacent to the upper flat surface of said canopy, to secure the second end of each hanger strap to said canopy.

4,711,323

DOOR DRIVE FOR DOORS OF ELEVATOR CARS

Max Haas, Kriens, Switzerland, assignor to Inventio AG, Hergiwil, Switzerland

Filed Nov. 12, 1985, Ser. No. 797,383

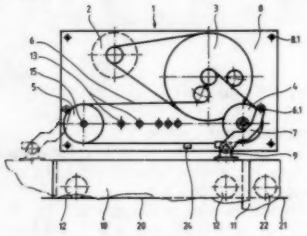
Claims priority, application Switzerland, Nov. 22, 1984, 05 582/84

Int. Cl.[4] B66B *13/08;* **E05F** *15/14*

U.S. Cl. 187—52 R **3 Claims**

1. A door drive for horizontally opening elevator car sliding door containing at least one door panel of a selectably predeterminate width, comprising:

a supporting structure fixed to the roof of said elevator car;
a motor fixed to said supporting structure;
two deflecting rolls arranged at said supporting structure;
at least one endless belt-shaped driving means drivingly connected with said motor and trained around said two deflection rolls;
said at least one endless belt-shaped driving means defining a drive run;
at least one coupling bracket arranged at said drive run of said endless belt-shaped driving means and mounted at said at least one door panel of said sliding door of said elevator car;
said door drive being adaptable to differently selected widths of said at least one door panel of said sliding door of said elevator car;
said two deflecting rolls arranged at said supporting structure of said door drive comprising a stationary deflection roll having an axis and a positionally changeable deflection roll having an axis and containing a shaft;
said supporting structure being provided with a predetermined number of fixing holes for selectively acccommodating said shaft to said positionally changeable deflection roll;



said fixing holes being arranged in said supporting structure at predetermined positions relative to said stationary deflection roll such that said axes of said stationary deflection roll and said positionally changeable deflection roll are arranged at a preselected center distance when said positionally changeable deflection roll is accomodated in a preselected one of said predetermined number of fixing holes provided in said supporting structure to thus adapt the door drive and the supporting structure to a selected value of the selectively predeterminate width of said at least one door panel;
each deflection roll of said stationary deflection roll and said positively changeable deflection roll having a respectively radius; and
said preselected center distance between said stationary deflection roll and said positively changeable deflection roll approximately corresponding to the selected value of the selectably predeterminate width of said at least one door panel minus said respective radii of said stationary deflection roll and said positionally changeable deflection roll.

4,711,324

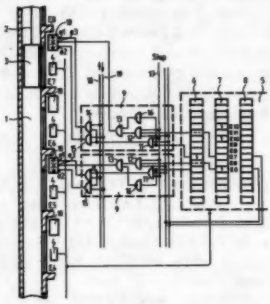
SERVICE INDICATING DEVICE FOR ELEVATORS

Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Switzerland

Filed Apr. 8, 1987, Ser. No. 36,562
Claims priority, application Switzerland, Apr. 14, 1986, 01477/86
Int. Cl.[4] B66B *3/00*
U.S. Cl. 187—135 **9 Claims**

1. An indicating device for the elevators of an elevator group, the elevator group including call register devices located on the floors for entering the calls for desired destination floors, and a group control device for assigning the calls to the cars of the elevator group, and where indicators are provided at the floors, which indicate to the passengers waiting at the floors, whether the desired destination floor can or cannot be reached with the arriving car, the indicating device comprising:

a first, a second and a third indicator element, said first and second indicator elements in the form of an upward and a downward arrow respectively, and said third indicator element shaped for signalling an entry prohibition, and a



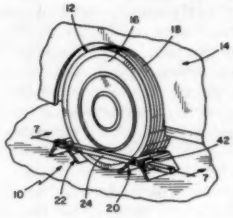
floor circuit connected by a first and a second input for activating said first and second indicator elements if the calls entered at an associated floor for desired destination floors are assigned to a car arriving at that floor, and said floor circuit connected by a third input for activating said third indicator if the calls entered at that floor for desired destination floors are not assigned to a car arriving at that floor.

4,711,325

WHEEL CHOCK ASSEMBLY

Craig E. Mountz, Wadsworth, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Jun. 16, 1986, Ser. No. 874,528
Int. Cl.[4] B60T *3/00*
U.S. Cl. 188—32 **5 Claims**



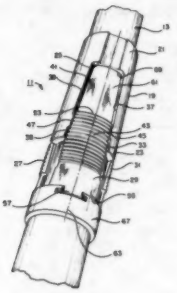
1. A wheel chock assembly comprising:
a pair of wedge members positionable in spaced apart relation one to another to receive a wheel therebetween;
a bar cooperable with said wedge members for retaining said wedge members in fixed disposition one to another;
means associated with one of said wedge members for slidingly receiving a first end of said bar;
means positionable on said bar for preventing relative outward movement of said wedge members;
wherein a second end of said bar is fixedly attached to the second wedge member; and,
wherein said means for preventing relative outward movement of said wedge members includes a movable tab having an aperture formed therein and said aperture is dimensioned to receive said bar.

4,711,326

SLIP GRIPPING MECHANISM

John L. Baugh, Huntsville, and Joe Foster, Spring, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 20, 1986, Ser. No. 876,515
Int. Cl.[4] B65H 59/10; E21B 23/04, 7/18
U.S. Cl. 188—67 9 Claims



1. A slip gripping mechanism for supporting a cylindrical conduit which is run from a well surface to a downhole location within the interior bore of a circumscribing conduit in a well bore, the cylindrical conduit being made up of a plurality of joints of pipe, at least one of the joints having a cylindrical external diameter which defines a length between a threaded connecting end at one extent and an opposite threaded connecting end at another extent, the slip gripping mechanism comprising:

an elongate tubular body having a tubular end at one extent with an internal bore, the bore being sized to slidingly receive the cylindrical external diameter of one of the joints of the cylindrical conduit which is to be supported from the circumscribing conduit whereby the tubular body is received directly on the cylindrical external diameter of the cylindrical conduit between the threaded connecting ends thereof, the tubular body having an opposite end provided with a plurality of circumferentially spaced longitudinally disposed slots;

a plurality of circumferentially spaced, vertically shiftable slips carried by the tubular body in the longitudinally disposed slots, each slip having side edges which engage mating profiles formed in the longitudinally disposed slots whereby the slots form guideways for the slips for shifting the slips upwardly and outwardly relative to the body between a set position engaging the circumscribing conduit and an unset position; and

setting means for effecting opposite relative motion between the tubular body and the slips.

4. A slip gripping mechanism for supporting a cylindrical conduit within the interior bore of a circumscribing conduit, comprising:

an elongate body adapted to be supported in the string of cylindrical conduit, the elongate body having a tubular end at one extent and having an opposite end provided with a plurality of circumferentially spaced longitudinally disposed slots;

a plurality of circumferentially spaced, vertically shiftable slips carried by the tubular body in the longitudinally disposed slots, each slip having a leading edge and a trailing edge and having side edges which engage mating profiles formed in the longitudinally disposed slots whereby the slots form guideways for the slips for shifting the slips upwardly and outwardly relative to the body between a set position engaging the circumscribing conduit and an unset position;

setting means for effecting opposite relative motion between the tubular body and the slips; and

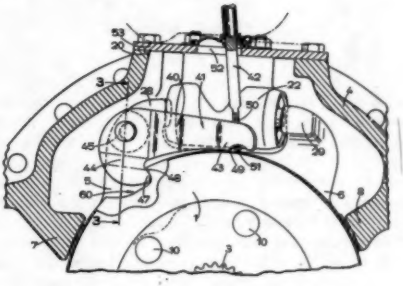
wherein each slip has an arcuate lower surface as defined radially from the longitudinal axis of the cylindrical conduit and wherein a by-pass groove is provided in the exterior surface of the tubular body in longitudinal alignment with each slip to thereby define a fluid flow path between each slip lower surface and the cylindrical conduit and between the by-pass groove and the circumscribing conduit and wherein each slip lower surface is provided with an undercut area in the region of the trailing edge which, along with the arcuate lower surface and by-pass groove in the exterior surface of the tubular body define the fluid flow path.

4,711,327

SELF-ENERGIZING DISC BRAKES

Anthony G. Price, Croseyceiliog, Wales; Roy Campbell, Bromsgrove, England, and Andrew P. Green, Pontnewydd, Wales, assignors to Lucas Industries, England

Filed Aug. 11, 1986, Ser. No. 895,201
Claims priority, application United Kingdom, Aug. 30, 1985, 8521592; Feb. 7, 1986, 8603106
Int. Cl.[4] F16D 55/04
U.S. Cl. 188—71.4 7 Claims



1. A self-energising disc brake comprising a housing, first and second axially spaced braking surfaces in said housing, radial pilot lugs and a drag-taking stop abutment in said housing, first and second pressure plates centred on said pilot lugs, adjacent faces of said pressure plates being provided with co-operating oppositely inclined angularly spaced recesses, rolling bodies located in complementary pairs of said recesses, a rotatable friction member disposed between each said pressure plate and an adjacent said braking surface, each said member comprising a disc, and first and second linings of friction material for engagement with said pressure plate and said braking surface carried by opposite faces of said discs, and means for moving said pressure plates angularly relative to said housing to initiate application of said brake with said pressure plates also moving axially to urge the friction members into engagement with said braking surfaces due to a tendency for said rolling bodies to ride up ramps defined by said end faces and constituting camming means, said plates being carried round with said discs until one of said plates is arrested by the engagement of a lug on that plate with said drag-taking stop abutment, whereafter continued angular movement of the other of said plates provides a servo action, wherein a mechanical brake-applying mechanism comprises a pull-rod which extends into said brake through a radial opening in said housing, said pull-rod having an inner end, a pivotally mounted lever having a radially innermost edge, a pivotal coupling for coupling said inner end to said lever, said lever being angularly movable in response to movement of said pull-rod in a generally radial direction in order to move said pressure plates angularly relative to each other to initiate application of the brake, and said coupling comprises an arcuate face defining a notch in said radially innermost edge of said lever, and a loop in said inner end of the pull-rod which receives said lever and

which has a bearing face having a rocking pivotal enagement with said arcuate face defining said notch.

4,711,328

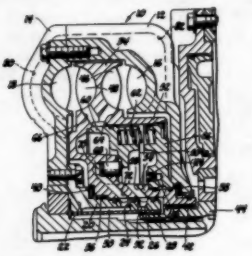
HYDRODYNAMIC RETARDER WITH A CENTRIFUGAL ACCUMULATOR

Rayman E. Bazilio; James F. Hartz, both of Indianapolis, and Anthony R. Uliana, Brownsburg, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 4, 1986, Ser. No. 937,836

Int. Cl.[4] F16D *57/00, 57/02, 33/06, 33/00*

U.S. Cl. 188—296 **2 Claims**



1. A hydrodynamic retarder for use with a transmission having a rotary shaft, said retarder comprising: stationary housing means including vane means; rotary housing means supported for rotation relative to said stationary housing means including drive means connected with the rotary shaft, vane means disposed in operative relation with said vane means in said stationary housing means, rotary storage chamber means disposed radially inward of said vane means for storing fluid prior to delivery to said vane means, fluid passage means connecting said rotary storage chamber means with said vane means, valve means slidably disposed in said rotary storage chamber means for permitting fluid flow from said rotary storage chamber means to said vane means when the valve means is moved to an open position, selectively operable control piston means for urging said valve means to said open position and spring means for urging said valve means to a closed position; supply passage means for distributing low pressure fluid to said rotary storage chamber means; and control means for selectively operating said control piston means for opening said valve means, said fluid stored in said rotary storage chamber means being subject to a centrifugal pressure and being available for rapid delivery to said vane means upon opening of said valve means to promote a hydrodynamic braking effect between the vane means on said stationary housing means and the vane means on said rotary housing means.

4,711,329

HYDRAULIC CIRCUIT CONSTRUCTION FOR POWER SHIFT TRANSMISSION

Shigekazu Hasegawa, Sakai; Satoshi Machida, Sannan, and Yoshimi Oota, Osaka, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 11, 1986, Ser. No. 850,861

Claims priority, application Japan, Aug. 28, 1985, 60-190156; Aug. 30, 1985, 60-192334

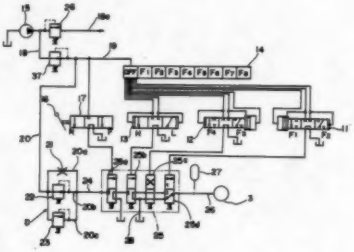
Int. Cl.[4] B60K *41/22*

U.S. Cl. 192—3.57 **9 Claims**

1. A hydraulic circuit construction for a power shift transmission having logical operation valve means mounted on a pressure oil supply passage connecting a hydraulic clutch to a pressure oil source, the logical operation valve means being operable to engage and disengage said hydraulic clutch by opening and closing the pressure oil supply passage in response to a switching operation of change speed means connected upstream of and in series to said hydraulic clutch, said hydraulic circuit construction comprising;

pressure control means mounted on said pressure oil supply passage and including a first valve means, a second valve means and orifice means mounted parallel to one another on said pressure oil supply passage,

said first valve means being switchable from an open position to a closed position when a pilot pressure from a hydraulic clutch side reaches a first predetermined value,



said second valve means being switchable from a closed position to an open position when the pilot pressure reaches a second predetermined value greater than the first predetermined value, and

accumulator means mounted on the pressure oil supply passage and between said hydraulic clutch and said pressure control means.

4,711,330

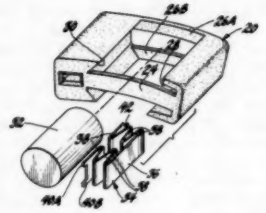
ROLLER CLUTCH WITH IMPROVED SPRING GUIDANCE

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1986, Ser. No. 903,786

Int. Cl.[4] F16D *15/00, 41/07*

U.S. Cl. 192—45 **3 Claims**



1. In an overrunning clutch of the type that operates in the annular space between first and second substantially coaxial races and that has a cage installable to one of said races within said annular space, said cage including a retention pocket having an axially inwardly facing stop surface, said clutch further having a wedging element that moves circumferentially within said retention pocket and which axially engages with said stop surface as said clutch operates, and an energizing spring mounted to said cage with a resilient active portion located within said retention pocket that urges said wedging element in a selected circumferential direction and which moves circumferentially with said wedging element as said clutch operates, said spring also being subjected to forces that tend to radially dislocate said spring as said clutch operates and wear said spring against said first race, an improved guide means to prevent said spring dislocation, comprising,

a circumferentially extending guide surface on said cage extending axially outwardly from said cage stop surface

and axially outside of said retention pocket and also located radially spaced from and confronting said second race, and,

a guide portion on said energizing spring extending axially outwardly away from the active portion of said spring and beyond said retention pocket stop surface so as to be trapped radially between said cage guide surface and said second race, whereby said dislocating forces will slidably engage said trapped spring guide portion on said cage guide surface as said clutch operates and thereby circumferentially guide said energizing spring to prevent it from wearing against said first race, said cage guide surface-spring guide portion slidable engagement, by virtue of being axially remote from both the active portion of said spring and from said cage stop surface, providing said circumferential guidance without substantial effect on the operation of said energizing spring and without limiting the circumferential motion of said wedging element.

4,711,331

FREEWHEEL OVERRUNNING CLUTCH, PARTICULARLY FOR A TWO-WHEEL VEHICLE

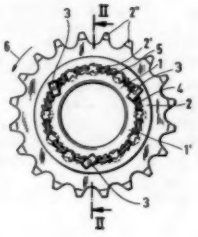
Joachim Hoffmann, Hagen, Fed. Rep. of Germany, assignor to Esjot-Werke Schiermeister & Junker GmbH & Co. KG, Ense-Niederense, Fed. Rep. of Germany

Filed Jul. 1, 1986, Ser. No. 880,890

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1985, 3523545

Int. Cl.⁴ F16D *41/28*

U.S. Cl. 192—46 **14 Claims**



1. In a freewheel overrunning clutch for a bicycle, moped, and the like vehicle having a plurality of clutch pawls present between an outer wheel and an inner wheel which are elastically supportable on one side on a circumference of said inner wheel and on the other side on a plurality of inner teeth of said outer wheel, the improvement wherein said clutch pawls are pivotally supported in a resilient flexible supporting ring positioned between said inner and outer wheels, said pawls each having an end facing said inner wheel which end is brought into engagement with a plurality of outer teeth on said inner wheel, said flexible supporting ring being simultaneously constituted as a spacing ring for a plurality of balls of a ball bearing, said ball bearing being positioned adjacent said clutch pawls and between said outer and inner wheels.

4,711,332

DRIVE CONNECTION WITH A FREEWHEEL MECHANISM

Max Schuster, Passau, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

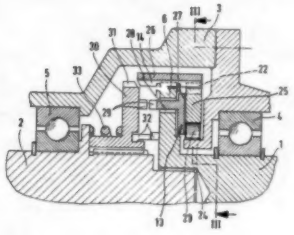
Filed May 22, 1986, Ser. No. 866,566

Claims priority, application PCT Int'l Appl., May 23, 1985, PCT/EP85/00246

Int. Cl.⁴ F16D *41/10*

U.S. Cl. 192—48.92 **3 Claims**

1. A drive connection for a drive and a driven co-axial shafts having a freewheel means therebetween which is lockable in a direction of rotation and allows the driven shaft to rotate faster than the drive shaft in said direction of rotation, said drive shaft includes a flange which pivotally supports a shift ring (13), said freewheel means is self-actuatably reversible by means of said shift ring (13) when said direction is reversed, and said shift ring (13), with the aid of a sensor of direction of rotation (22) supported on a non-rotational housing (3), can be brought from



a first position in one direction of rotation to a second position in the opposite direction of rotation and vice versa, characterized in that said sensor of direction of rotation (22) is a shift element which is retained against said housing (3) in frictional engagement only during reversing operation of said direction of rotation and is maintained out of frictional engagement with said housing (3) after the reversing operation has occurred.

4,711,333

SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

Minoru Okamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 856,062

Claims priority, application Japan, Apr. 30, 1985, 60-92976

Int. Cl.⁴ B60K *41/04, 41/28;* F16D *43/22*

U.S. Cl. 192—0.076 **10 Claims**

1. A control system for a four-wheel drive vehicle having an engine, a transmission, means comprising a main clutch for transmitting the output of the engine to the transmission, main drive wheels operatively connected to an output shaft of the transmission, auxiliary drive wheels, means comprising a transfer clutch for transmitting output of the transmission to the auxiliary drive wheels, the transfer clutch having a controllable clutch torque capacity, the system comprising:

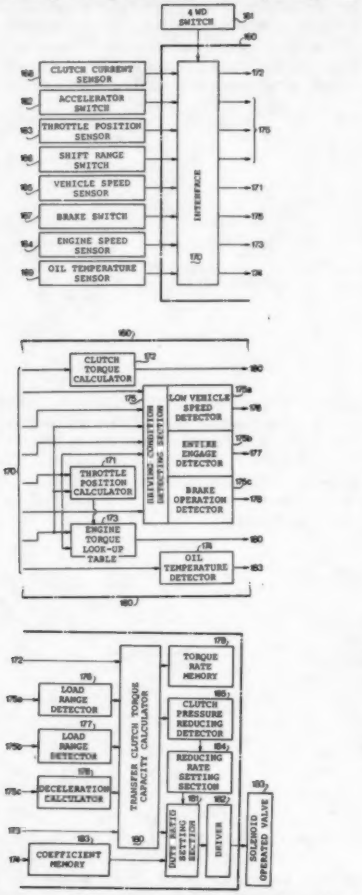
a vehicle speed sensor provided to detect vehicle speed and to produce a vehicle speed signal;

means for providing an engine torque signal representative of engine torque dependent on an operating condition of the engine;

first control means responsive to the vehicle speed signal and the engine torque signal for engaging the transfer clutch at a torque capacity which is determined by a predetermined rate of the engine torque in accordance with the vehicle speed signal;

detector means responsive to a transfer clutch torque capacity reducing signal for producing a clutch torque reducing signal;

second control means responsive to the clutch torque reducing signal for gradually reducing the torque capacity



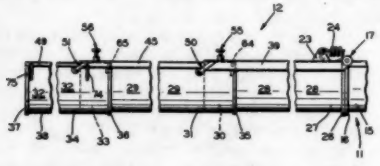
determined by the first control means to a predetermined value.

4,711,334

TELESCOPIC CHUTE FOR MIXER DISCHARGE

Joseph A. Barry, 701 SW. 35th Ave., Boyton Beach, Fla. 33435, and Leo J. Barry, 225 W. Maple Ave., Bound Brook, N.J. 08805

Filed Aug. 28, 1986, Ser. No. 901,425
Int. Cl.[4] B65G *11/14*
U.S. Cl. 193—6 **26 Claims**



15. A telescopic extension chute assembly for a material mixer comprising:

a first chute section having a body of generally semicircularly cross-section with an inlet end including means for coupling to a material mixer discharge opening;

first track means including a pair of tubular bodies of generally rectangular cross-section, each of said tubular bodies being attached to and extending along an associated upper edge of said first chute section body, each of said tubular bodies having a longitudinally extending slot formed in a bottom wall thereof;

a second chute section having a body of generally semicircular cross-section of a larger radius than said first section and a pair of upper edges extending through associated ones of said slots in said first track means;

a second track means including a pair of tubular bodies of generally rectangular cross-section, each of said second track means tubular bodies being attached to and exending along an associated one of said upper edges of said second chute section body and having a longitudinally extending slot formed in a bottom wall thereof;

wherein said first track means includes a pair of rollers rotatably attached at an end opposite said inlet end and engaging a downwardly facing outer surface of said bottom all of said second track means bodies;

a third chute section having a body of generally semicircular cross-section of a larger radius than said second section and a pair of upper edges extending through associated ones of said slots in said second track means; and

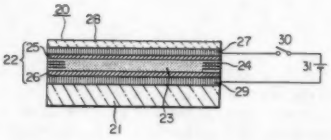
a third track means including a pair of bars of generally rectangular cross-section, each attached to and extending along an associated one of said upper edges of said third cute section body whereby said second chute telescopes over said first chute and said third chute telesocpes over said second chute and said first, second and third track means cooperate to enable relative longitudinal movement among said first, second and third chutes.

4,711,335

DISPLAY DEVICE FOR AN ESCALATOR

Eiki Watanabe, Inazawa City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 3, 1986, Ser. No. 903,378
Claims priority, application Japan, Sep. 5, 1985, 60-196224
Int. Cl.[4] B65G *17/00*; B66B *9/00*
U.S. Cl. 198—324 **5 Claims**



1. An elevator comprising:

an escalator having balustrade side panels;

switch means mounted on one of said balustrade side panels and operable to shift said escalator between operation modes;

a display device actibatable for displaying matters to be noted for operating said escalator in one of the operation modes;

circuit means connecting said switch means to supply power from an electric power source to said display device when said switch means is operated to the one of the operation modes to activate said display device, said display device comprising:

a liquid crystal layer;

a pair of electrodes disposed on the opposite sides of said liquid crystal layer, one of said electrodes being a transparent pattern electrode having a pattern corresponding to a display of the matters to be noted, the other electrode being a transparent common electrode;

wherein said switch means is connected by said circuit means between the electric power source and said electrodes and interrupts the electric power supply to said electrodes so that said liquid crystal layer does not display any indication of

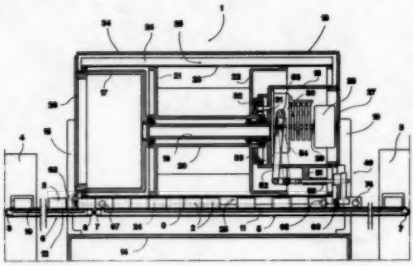
the matters to be noted during another of the operation modes and connects the electric power source to said electrodes so that said liquid crystal layer displays the matters to be noted during the one of the operation modes.

4,711,336

APPARATUS FOR TRANSPORTING SUBSTANTIALLY PARALLELEPIPEDIC PACKETS

Riccardo Mattei, Bologna, Italy, assignor to G.D. Societa Per Azioni, Bologna, Italy

Filed Dec. 19, 1985, Ser. No. 811,096
Claims priority, application Italy, Jan. 28, 1985, 3316 A/85
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—347 **12 Claims**



1. An apparatus for supplying substantially parallelepipedic packets between a machine for supplying and a machine for receiving these packets, comprising at least one substantially horizontal conveyor for connection between the machines and a substantially cylindrical store having an axis parallel to the conveyor provided on its periphery with angularly uniformly spaced radial compsartments, lying above the conveyor and substantially tangential thereto, such that the conveyor defines a base wall for the lower compartment of the store, means for the intermittent actuation of the store about its axis, device for intercepting the packets at both ends of the lower compartment and a cylindrical fairing winding about the store, characterised in that it comprises, in the vicinity of the lower compartment and disposed between an edge of the conveyor and an inlet edge of the fairing, a connection bridge designed to assume a first and a second position as a function of the direction of rotation of the store.

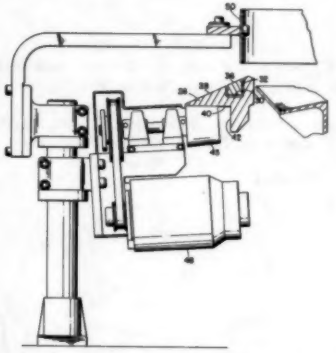
4,711,337

ARTICLE FEEDER RING FOR USE IN A VIBRATORY BOWL FEEDER

Maynard L. Bartlett, Farmington, Conn., assignor to The Arthur G. Russell Company, Inc., Bristol, Conn.

Filed Dec. 23, 1986, Ser. No. 945,783
Int. Cl.[4] B65G *27/02*
U.S. Cl. 198—391 **2 Claims**

1. Apparatus for orienting and feeding articles of the general type having an axially elongated body portion and a radially enlarged portion axially spaced from at least one end of the body portion, said apparatus including a feeder bowl having a vertical axis, for containing a supply of the articles and having a generally helical track surface extending along the inner periphery of the bowl and which track surface has a terminal portion at the upper edge portion of the bowl and which terminal portion has a radially outer arcuate edge free of any portion of the bowl extending generally upwardly therefrom and which terminal portion of said track surface extends generally inwardly and upwardly from the arcuate outer edge, feeder bowl drive means for vibrating the bowl to move the articles onto the track surface and along the track surface in one direction of movement about the vertical bowl axis and in generally axial end-to-end relation to each other, said terminal portion of said track surface having a downstream end defining the limit of its extension in the one direction of movement about the vertical bowl axis, an annular ring concentric with the vertical bowl axis surrounding the upper edge portion of the bowl and having a generally upward by facing annular article supporting surface with an inner circular edge closely adjacent to the outer arcuate edge of the terminal portion of the track surface, the annular article supporting surface of the ring being generally in line with the terminal portion of the bowl track surface, as seen on a vertical plane passing through the supporting surface and the terminal portion of the track surface and containing the vertical bowl axis, and extending generally outwardly and downwardly from its inner circular edge to form essentially a generally radially outward extending continuation of the terminal portion of the bowl track surface for receiving articles after they move radially outwardly beyond the terminal portion, means supporting the annular ring for rotation about the vertical bowl axis, and a stationary arcuate baffle concentric with the vertical bowl axis extending circumferentially along the length of the terminal portion of the track surface and also extending for some distance beyond the downstream end of the terminal portion of the track surface in the direction of rotation of the ring, the baffle having a lower edge spaced above the supporting surface of the ring and located radially a substantial distance outwardly from the inner edge of the support surface of the ring so that a substantial portion of the supporting surface is located radially inside of the baffle and another substantial portion of the supporting surface is located radially outside the baffle, the vertical spacing between



the lower edge of the baffle and the supporting surface of the ring being such as to allow the body portion of each article to pass through the space so formed and to prevent passage of its enlarged portion such that after an article moves radially outwardly from the terminal portion of the bowl track surface to the supporting surface of the ring, the body portion of the article will swing radially outwardly through the space between the lower edge of the baffle and the supporting surface and its radially enlarged portion will be restrained against further radial outward movement by engagement with the baffle, the baffle being so radially spaced outwardly from the inner edge of the supporting surface of the ring that after an article has its body swung radially outwardly through the space the portion of the supporting surface located radially inwardly of the baffle is of sufficient radial extent so as to entirely receive the radially enlarged portion of the article and the body portion is underlayed by a portion of the ring located radially outwardly of the baffle, the baffle some distance circumferentially downstream beyond the downstream end of the terminal portion of the track surface having a discharge point at which the lower edge no longer restrains the enlarged portions of the articles so that the articles are free to move from the ring support surface, said improvement comprising:

said annular ring article supporting surface including an annular groove concentric with the vertical bowl axis and located intermediate the inner circumferential edge of said

annular ring and the outermost radial distance beyond the inner circumferential edge, said annular ring radially outward extending article supporting surface being substantially flat and planar along the surface between said inner edge and said groove and the outermost edge and said groove;

a ring concentric with the vertical bowl axis and adapted to fit within said annular groove in said annular ring;

means for holding said ring stationary with respect to the rotation of said annular ring;

said stationary ring having an upwardly facing article supporting surface, said stationary ring supporting surface being coincident with the article supporting surface of said annular ring so that the combined supporting surface of said annular ring and said stationary ring provide a substantially continuous, planar article supporting surface extending radially outwardly from said inner edge of said annular ring so that said article after its body portion has swung through said space is supported by and in close proximity to said annular ring and said stationary ring support surfaces along its length on opposite sides of said baffle whereby the body portion of an article swung through said space is prevented from wedging itself between said article support surfaces and the body portion of an article supported by said ring and said stationary ring support surfaces.

4,711,338

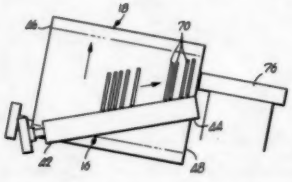
LID FEEDING MACHINE

David E. Carson, and Gary A. Barnhart, both of Lawrence, Kans., assignors to Carson/Burger/Weekly, Inc., Lawrence, Kans.

Continuation of Ser. No. 698,885, Feb. 2, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 921,903

Int. Cl.[4] B65G *47/14*

U.S. Cl. 198—396 **18 Claims**



1. A lid feeding machine for receiving and separating a group of lids and for feeding the lids individually toward a delivery point, said machine comprising:

a first driven planar belt lying in a first plane; and

a second driven planar belt lying in a second plane, there being means for positioning said belts in a proximal relationship such that said planes intersect to define a juncture line at the intersection thereof and to define a juncture angle of less than 180° therebetween on one side of said juncture line, said first belt being driven in a first direction toward said second belt, said second belt being driven in a second direction outwardly from said one side, said belts being driven at substantially the same speed and at sufficient speed such that lids received by said machine will be driven by said first belt toward said second belt into simultaneous engagement by both of said belts and, when so engaged, will be moved to or maintained in a substantially vertical position, separated, and spun to thereby stabilize the lids in said position while being fed along both of said belts in a direction parallel to said juncture line toward the delivery point.

4,711,339

CIGARETTE STACKING METHOD AND APPARATUS

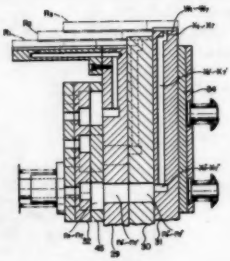
Tomizou Nagata; Yoshiyuki Mutoh, and Kazutaka Kobayashi, all of Tokyo, Japan, assignors to Japan Tobacco, Inc., Japan

Continuation of Ser. No. 647,903, Sep. 6, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,788

Claims priority, application Japan, Sep. 13, 1983, 58-167583

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—419 **6 Claims**



1. A cigarette stacking method using a stacking drum and a plurality of arranging drums provided in close proximity to the outer periphery thereof, comprising the steps of;

establishing different positions on said stacking drum in the axial direction thereof for cigarette pieces arranged by said plurality of arranging drums;

stacking cigarette grousp formed on said arranging drums in several layers on said stacking drum in such a manner as to extend the end portions of the cigarette pieces successively in the axial direction on the stacking drum so that each layer is staggered with respect to an adjacent layer; and

absorbing and maintaining the cigarette pieces in each staggered layer by applying suction directly to the staggered end portions of each said cigarette in each said layer.

4,711,340

DEVICE TO DISCHARGE ROLLED PRODUCTS ONTO A COOLING PLATE, CLOSURE OF THE DEVICE TAKING PLACE BY POSITIVE ACTUATION

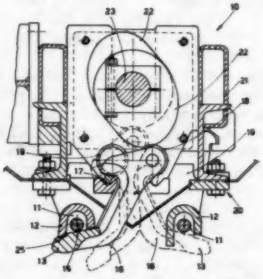
Antonino Duri, Pradamano, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Italy

Filed Jan. 23, 1986, Ser. No. 824,580

Claims priority, application Italy, Jan. 23, 1985, 83320 A/85

Int. Cl.[4] B21B *43/12*

U.S. Cl. 198—451 **9 Claims**



1. An apparatus cooperating with a tail-brake means for discharging rolled products onto a cooling plate, comprising:

at least two channels with bottoms which comprise movable vanes capable of being opened and closed; and

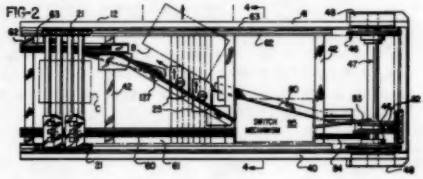
a common actuating means having operable contacting cams for actuating the vanes of said at least two channels to selectively open and close said vanes, the closure and opening of said vanes being achieved by positive actuation and gravity, respectively.

4,711,341

PACKAGE SORTATION CONVEYOR

Thomas C. Yu; Robert K. Vogt, and John J. Wilkins, all of Cincinnati, Ohio, assignors to The E. W. Buschman Company, Cincinnati, Ohio

Continuation of Ser. No. 675,156, Nov. 27, 1984, abandoned. This application Jun. 26, 1986, Ser. No. 878,734
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—372 **7 Claims**



1. A package conveyor system including a main line and at least one branch line leading from one side of said main line, comprising

(a) a frame defining said main line and at least one branch outlet therefrom,

(b) an endless apron supported for movement on said frame to define a top conveying run and a bottom return run,

(c) means for driving said apron,

(d) a plurality of pusher elements mounted for sliding movement on said apron from one side thereof to the other,

(e) each said pusher element having a guide member depending therefrom,

(f) primary guide means cooperating with said guide members to retain said pusher elements on the side of said frame opposite said branch outlet

(g) a switch member shiftably mounted on said frame upstream from said branch outlet for movement between a retracted position wherein it forms a continuation of said primary guide means and an advanced position wherein it cooperates with successive said guide members to divert successive said pusher elements away from said primary guide means,

(h) secondary guide means extending across said frame at an angle to the length thereof opposite said branch outlet for cooperation with said guide members on successive said diverted elements to guide said diverted pusher elements across said apron and thereby to push a package from said apron to said branch outlet,

(i) means downstream from said branch outlet for returning said diverted pusher elements to said primary guide means, and

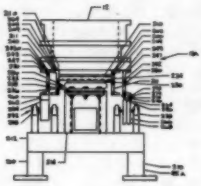
(j) supplemental guide means responsive to incomplete movement of said switch member between said retracted and advanced positions thereof for effecting the return of each resulting incompletely diverted guide member to said primary guide means.

4,711,342

CONVEYOR TRANSFER APPARATUS FOR FOUNDRY USE AND METHOD OF CONVEYOR TRANSFER

Edward D. Abraham, Brecksville, Ohio, assignor to Lucille S. Abraham, Brecksville, Ohio

Continuation-in-part of Ser. No. 339,172, Jan. 13, 1982, abandoned. This application Dec. 24, 1984, Ser. No. 685,594
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—463.3 **9 Claims**



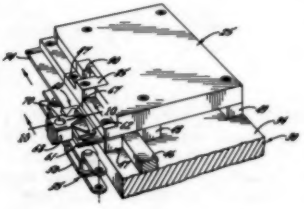
7. A conveyor transfer system for use in a foundry to transfer an article along an article-travel-path including a frame, a plurality of vertically movable support members, means for attaching said support members to said frame while allowing vertical movement thereof including at least one flex plate having one end secured to said frame and another end secured to at least one of said vertically movable support members, at least one horizontally movable beam defining said article-travel-path and positioned outboard of and adjacent to said support members, means for attaching said at least one beam to said frame while allowing horizontal movement thereof, means for moving said support members in a vertical direction between a raised and a lowered position to move an article supported thereon between the raised and the lowered positions, and means for moving said at least one beam in a horizontal direction to move an article supported thereon along said article-travel-path.

4,711,343

POWER-AND-FREE CONVEYOR APPARATUS FOR HANDLING PALLET-SUPPORTED WORKPIECES

Paul A. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 864,417, May 19, 1986. This application Oct. 3, 1986, Ser. No. 915,241
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—465.2 **12 Claims**



1. Apparatus for handling workpieces and comprising a row of pallets each adapted to hold a workpiece, continuously driven power-and-free conveyor means for advancing said pallets in a closed circuit along a generally horizontal and endless path having opposing straight sides and opposing curved ends, said conveyor means being operable to advance said pallets through at least one work station along said path and being operable to allow said pallets to dwell along said path when said pallets are stopped during continued driving of said conveyor means, said apparatus being characterized in that said conveyor means comprise a plurality of at least four

modules located along the sides and ends of said path, each of said modules comprising (a) a generally horizontal individual track for supporting said pallets, (b) an individual power-driven endless conveyor for advancing said pallets along said track and for allowing the pallets to dwell on said track when the pallets are stopped during continued driving of the conveyor and (c) an individual motor for continuously driving said conveyor; there being two modules adjacent each end of said path with the track and conveyor of each of such modules having a curved section extending along a portion of the curved end of the path and having a straight section extending along a portion of one of the straight sides of the path, the track and conveyor of each module being disposed in end-to-end relation with the tracks and conveyors of two other modules, and means for detachably holding said modules in rigid end-to-end relation, each of said pallets including a lip extending generally along said path and projecting toward said conveyors, each of said conveyors comprising a series of spaced clamps for tightly gripping the lips of said pallets to advance said pallets along said path, said clamps slipping frictionally along the lip of each pallet when the pallet is stopped and as driving of said conveyors continues.

4,711,344

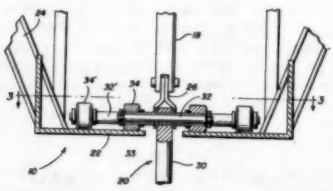
ACCURATE WEIGHT SORTING ARRANGEMENT FOR POULTRY CONVEYOR SYSTEM

Paul J. Altenpohl, 1211 Lafayette Rd., Gladwyne, Pa. 19035

Filed Jan. 9, 1986, Ser. No. 817,407

Int. Cl.[4] G01G *11/00*

U.S. Cl. 198—504 **12 Claims**



4. In a weight sorting system for objects held by consecutive carriers suspended from a conveyor while traveling along a common path, said consecutive carriers being uniformly spaced from each other along said common path by a distance (S), including a fixed track, at least one platform, means operatively mounting the platform in alignment with the track for sequential loading only by non-consecutive carriers during said travel along the path and means for detecting a preset limit of said loading of the platform by the non-consecutive carriers, said platform having a length measured along said common path greaterr than (S).

4,711,345

COMPOSITE-MOTION DRIVE UNIT AND COMBINATORIAL WEIGHING APPARATUS EMPLOYING THE SAME

Masao Fukuda; Yukio Kakita, both of Shiga; Kenji Ueda, Kyoto; Kiichi Terashima, and Hiroshi Bochi, both of Shiga, all of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Filed Aug. 28, 1985, Ser. No. 770,063

Claims priority, application Japan, Aug. 28, 1984, 59-180142; Aug. 28, 1984, 59-131186[U]; Aug. 28, 1984, 59-131187[U]; Aug. 28, 1984, 59-131188[U]

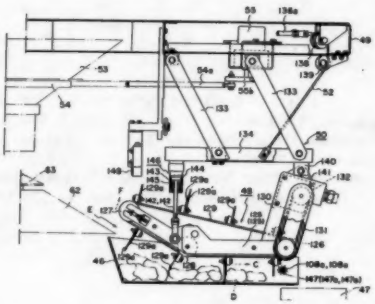
Int. Cl.[4] B65G *43/08*

U.S. Cl. 198—572 **5 Claims**

1. A combinatorial weighing apparatus having a plurality of vibratory supply troughs for distributing and supplying articles therethrough to a plurality of weighing machines for effecting combinatorial weight computation, said combinatorial weighing apparatus comprising:

a plurality of sweep conveyors disposed respectively above said supply troughs for forcibly transferring the articles from said supply troughs to said weighing machines; and

means for continuously actuating said sweep conveyors until articles reach the ends of respective supply troughs when



the articles have not reached said ends of the supply troughs for a prescribed period of time at the time said supply troughs and said sweep conveyors are operated to transfer the articles toward said weighing machines.

4,711,346

PLASTIC CONVEYOR BELT WITH EXTENSION-RESISTANT REINFORCEMENT AND DRIVE GEARING

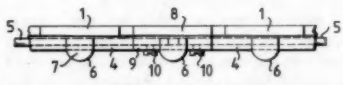
Rudolf Breher, Porta Westfalica, and Rudi Kölling, Vlotho, both of Fed. Rep. of Germany, assignors to BRECO Kunststoff-verarbeitungs-GmbH & Co. KG, Porta Westfalica, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 774,124

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433379

Int. Cl.[4] B65G *15/30*

U.S. Cl. 198—844 **2 Claims**



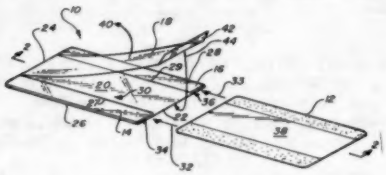
1. An endless conveyor belt comprising a plurality of spaced plates of hard, rigid plastic material spaced from one another, each of said plates having a drive cog extending from the underside thereof, an elongated, soft elastically-deformable rib member attached to the underside of each of said plates to thereby connect said plates together, a tensional reinforcement means embedded in said rib member, said rib member crossing said drive cog, connecting means for connecting two ends of said rib member, said connecting means comprising an intermediate plate disposed between two of said spaced plates, an intermediate drive cog extending from the underside of said intermediate plate, a metal rib element extending through said intermediate drive cog, said metal rib element having a passage, said reinforcement means extending beyond the longitudinal ends of said rib member and extending into said passage, and clamping means on said metal rib member for clamping said reinforcement means in said passage.

4,711,347

PROTECTIVE ENVELOPE FOR OPTICAL DATA CARD

Jerome Drexler, Los Altos Hills, and Richard Haddock, Redwood City, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Filed Feb. 14, 1986, Ser. No. 829,802
Int. Cl.[4] B65D 75/28, 85/16
U.S. Cl. 206—38 26 Claims



1. A protective envelope for use with a data card comprising,

a data card having a data storage area thereon,

a planar base member having front, back and opposed side edges, and

a cover assembly bonded to said base at said back edge and said opposed side edges thereby forming a pocket between said base and said cover assembly for insertion of said data card.

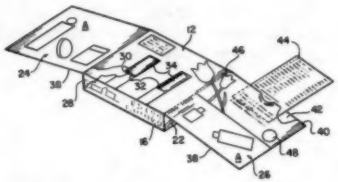
said cover assembly being made up of a pair of fixed edge strips and at least one flap, said edge strips being spaced apart to define a data storage access area therebetween and being bonded to said base at said back edge and respective side edges, said edge strips projecting inwardly from the respective side edges and extending along substantially the entirety of the side edges, said flap being pivotally bonded to said base at said back edge and being disposed to selectively cover said data storage access area, said fixed edge strips each having a portion spaced apart from said base by the insertion of said data card to frictionally secure said data card when said flap is lifted.

4,711,348

CONTAINER FOR PRODUCT SAMPLES

Allen Schluger, 21 W. 68th St., New York, N.Y. 10023

Filed Apr. 24, 1986, Ser. No. 855,330
Int. Cl.[4] B65D 77/00
U.S. Cl. 206—45.29 6 Claims



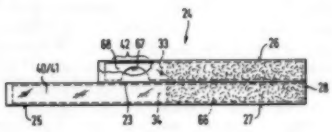
1. A cardboard blank to be folded into a box for use in mailing product samples, said blank comprising a central panel delineated by upper and lower edges and opposite side edges and presenting a surface for imprinting product information on a flat surface thereof within the confines of said edges, a gluing tab extending from said lower edge and interconnected plural panels extending from said upper edge, said interconnected plural panels being adapted to be folded along said upper edge and beneath said central panel and to be adhesively secured to said gluing tab to form a box of said interconnected plural panels bounding a compartment beneath said central panel, a foam block sized to be positioned in said compartment and having at least one recess for a product sample, a cut-out in said central panel opening into said recess for positioning a product sample therein, and a pair of side panels each extending laterally from one said opposite side edges in contiguous relation to said central panel so as to present additional surfaces on opposite sides thereof for imprinting product information, said side panels being adapted to be folded in overlapped relation in one direction in closing movement upon said central panel and in opposite direction unfolding movement to present a display of said surfaces thereof in adjacent relation on opposite sides of said surface of said central panel, whereby any imprinting for completing said display can be applied simtultaneously to said blank in the flat within said surfaces of said side and central panels and automatically will be in registration across said opposite sides edges.

4,711,349

POUCH PACK FOR TOBACCO AS WELL AS A PROCESS AND APPARATUS FOR MAKING THIS

Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Continuation of Ser. No. 714,049, Mar. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 647,492, Sep. 5, 1984, abandoned, which is a continuation of Ser. No. 421,614, Sep. 22, 1982, Pat. No. 4,505,385. This application Mar. 23, 1987, Ser. No. 29,383
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214240
Int. Cl.[4] B65D 85/10
U.S. Cl. 206—260 8 Claims



1. A pouch pack for fibrous material, especially cut tobacco, comprising a multi-layer blank made of plastic foils, which forms a pocket with a front wall, a rear wall, a bottom and side walls and, as a continuation of the rear wall, a closure flap, said side walls being perpendicular to said front and said rear wall when the pouch is filled with the fibrous material, and a closing strip, an orifice of the pocket being sealed by said closing strip; a flat insert (22) disposed between said foils, and extending into the region of said side walls, said insert being stiffer than said foils; wherein the closing strip (36) extends over the entire width of the spread-out blank, and lateral strip-shaped projecting lengths (40, 41) of the closure flap (25), including the closing strip (36) but excluding said walls forming said pocket, are folded over inwardly such that the closure flap has approximately the width of the front and rear walls (26, 27) of the pocket (24); wherein the projecting lengths (40, 41) form, in the region of an orifice (32) of the pocket, a smooth transition (42) to the transverse side walls (29, 30) of the pocket (24); wherein said flat insert (22) disposed between said foils has a lateral recess (67) in an edge thereof and at a location which corresponds to, and encompasses, only the area of said transition (42) and which is entirely spaced from said closing strip (36) on the pocket-side thereof.

4,711,350

INSPECTABLE ANTISTATIC CONTAINER FOR PACKING ELECTRICAL OR ELECTRONIC DEVICES

Wei Hsiung Yen, 8, Chia Ping Road, #01-01/08 S'pore, Singapore, Singapore (2261)

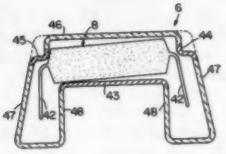
Filed Oct. 27, 1986, Ser. No. 923,207
Int. Cl.[4] B65D 85/42, 65/18
U.S. Cl. 206—328 7 Claims

1. A container for electrical and electronic components

having electrical contact legs, which are susceptible to damage by static electrical discharges, comprising:

a tubular casing composed of a continuous peripheral wall of a generally uniform wall thickness, said casing being adapted to receive the component; a plurality of inset shoulder portions formed by said wall and projecting inwardly toward an interior of said casing to restrict movement of the component; said tubular casing having at least one lengthwise electrically conducting strip on an inner surface of each one of said lengthwise inset shoulder means for engaging said component;

said tubular casing having a cross-section which is generally in a "U" shape; each leg of said "U" shape being substantially completely transparent; each said leg having an inner leg portion;



said tubular casing having a substantially completely transparent top portion connecting said inset shoulder portions;

said tubular casing having a leg connecting portion bridging said inner leg portions of each of said legs to form a rest for the component; said rest having an inner surface which is electrically conductive; substantially all remaining portions of said tubular casing being free of electrically conductive interior surfaces;

whereby permissible movement of the component within said tubular casing brings the component only into contact with one of said electrically conductive portions and not into direct contact with said transparent portions.

4,711,351

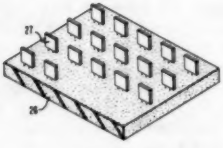
APPARATUS FOR STORING ELECTRONIC COMPONENTS

Richard S. Zucker, Ellicott City, and Philip J. Adinolfi, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 528,022, Aug. 31, 1983, abandoned. This application Dec. 17, 1985, Ser. No. 809,702

Int. Cl.⁴ B65D *73/02*

U.S. Cl. 206—331 **3 Claims**



1. Apparatus for storing electrical components having semi-rigid leads, comprising a body of resilient gel having a substantially flat upper surface permitting components to be stored by inserting said semi-rigid leads of said electrical components into said gel, and wherein said body of resilient gel has a thickness selected such that the leads of said components do not penetrate through said body of resilient gel, the constituents of said gel being selected such that:

(1) said semi-rigid leads may be inserted into said gel without substantially bending said semi-rigid leads;

(2) said gel does not harden or otherwise substantially deteriorate with time; and

(3) such that said gel does not contaminate said component such that subsequent assembly processes are jeopardized; and the gel comprises by weight:

(a) approximately 13% castor oil based prepolymer;

(b) approxiamtely 60% castor oil based polyol;

(c) approximately 20% dimethylpolysiloxane; and

(d) approximately 2% ammonia salt.

4,711,352

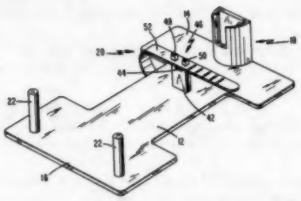
DELICATE INSTRUMENT HOLDER AND PROTECTOR

Rodger W. Williams, and Charles W. Atwood, both of Nashville, Tenn., assignors to Vxtra Corp., Nashville, Tenn.

Continuation of Ser. No. 739,216, May 30, 1985, abandoned. This application Aug. 13, 1986, Ser. No. 896,335

Int. Cl.⁴ B65D *83/10*

U.S. Cl. 206—365 **5 Claims**



1. A device for holding and protecting a delicate instrument, comprising a generally rigid base; first means disposed on the base for securing one end of the instrument to the base; second means disposed on the base in spaced relationship from the first securing means for securing another end of the instrument to the base; said first and second securing means arranged to support the instrument in a raised position from the base; and spacing means including at least one spacer column projecting upward from the base to protect the instrument from being damaged by the application of pressure in a direction substantially perpendicular to the base, said second securing means including an opening loosely receiving said another end of the instrument, and means for preventing said another end of the instrument loosely positioned within said opening from being inadvertently dislodged from said opening.

4,711,353

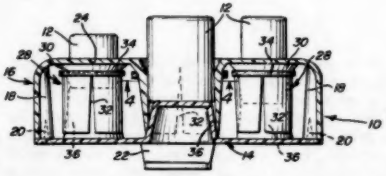
SOCKET ORGANIZER

Raymond L. Rozmestor, P.O. Box 1241, Delran, N.J. 08075

Filed May 1, 1986, Ser. No. 858,166

Int. Cl.⁴ B65D *85/28*

U.S. Cl. 206—378 **14 Claims**



1. An article holder comprising a housing having a wall, an opening in the wall, an article receiver of tubular form supported by the wall with said opening defining an open end of the receiver, the receiver being slit longitudinally to form a plurality of circumferentially spaced segments with the segments being radially expandable and contractable and resiliently resisting radial expansion whereby an article of suitable

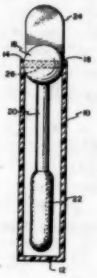
size inserted into the receiver may resiliently expand the receiver for retention therein by a resilient radial gripping force exerted by said receiver and peripheral contracting means exerting radial inward force on the segments of the receiver.

4,711,354

ARTICLE DISPENSER FOR LIPSTICK OR THE LIKE

Robert Bennett, Easton, Conn., assignor to KJS Industries, Inc., Marlboro, N.J.

Filed Dec. 9, 1986, Ser. No. 939,733
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—385 **2 Claims**



1. An article dispenser comprising:

an elongated hollow cylindrical plastic container closed at one end and having an opening in the other end, the container having an inner wall, the opening in the other end being circular and having a first radius;

a plastic article consisting of an elongated plastic member having an enlargement intermediate its ends, the portion of the member between the one end and the enlargement being defined as a first section, the portion of the member between the enlargement and the other end being defined as a second section, the first section being a rod of generally circular cross section having a coating which extends from the one end toward, but spaced from the enlargement, the enlargement having a spherical shape with a second radius only slightly smaller than the first radius, the first section of the member extending into the container with the enlargement being in sonic weld sealed engagement with the opening in the other end of the container and being spaced from the wall and closed end of the container, the second section being thin and flat with a generally rectangular shape in cross section and extending entirely outside of the container whereby, when the container is held in place while the second section is rotated, the sonic weld breaks, permitting the article to be removed from the container.

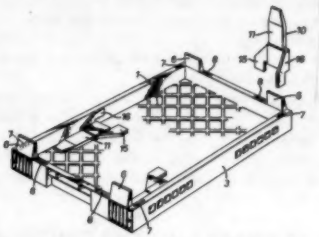
4,711,355

STACKABLE BOX

Simon J. M. Veenman, P.O. Box 160, 2690 AD 's-Gravenzande, Netherlands

Filed Sep. 20, 1985, Ser. No. 778,562
Claims priority, application Netherlands, Sep. 27, 1984, 8402955; Oct. 29, 1984, 8403273
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—503 **16 Claims**

1. A stackable box for receiving objects, said box having a bottom and upright transverse and longitudinal sidewalls, said sidewalls having upper exposed surfaces and intersecting with one another at a common corner point, a recess in the exposed upper surface of each wall in the proximity of the said corner point, a detachable extension piece at said corner point, said extension piece having a bottom surface resting on the said upper exposed surfaces between said recesses and a pair of integral wings, each wing of said pair extending parallel with a respective sidewall and defining with said extension piece a registering common corner point and each having a portion



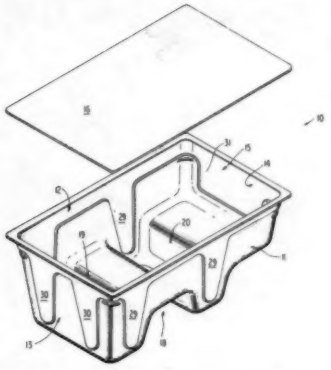
extending downwardly and arranged to be inserted in and received by a respective recess.

4,711,356

CONTAINER FOR FREEZING AND STORAGE OF FOODSTUFFS

Walter J. Dunden, Eugene, Oreg., assignor to Chef Francisco, Inc., Eugene, Oreg.

Filed Oct. 29, 1980, Ser. No. 201,908
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—503 **22 Claims**



1. An article for use in the packaging, freezing and storing of fluid foodstuffs comprising:

an open-topped elongated rectangular container molded of extensible sheet plastic material to be closed by a substantially rectangular lid;

said container having a body defined by generally parallel, slightly downwardly convergent side walls and generally parallel, slightly downwardly convergent end walls, the depth of one end wall being substantially greater than the depth of the other end wall;

and a corrugated bottom joined with the side walls and end walls and defining with the side walls and said one end wall at least two downwardly depending transverse substantially parallel pockets of equal depth spaced from each other and from said other end wall and having downwardly convergent walls;

said bottom defining with the side walls and said other end wall at least two generally horizontal transverse ledges spaced from each other and disposed in the same horizontal plane, one of the ledges being disposed between a pair of said pockets;

whereby when empty, a plurality of said containers may be nested in one another, and when filled, one container may be inverted and reversed end for end so that a second similar filled container may be superposed thereupon with a ledge of the second container supported upon the apex

of an upwardly projecting pocket of said one container and with the margins of the respective tops in vertical alignment with each other;

the plastic being of a type which is extensible in response to the expansive force of the foodstuff during the freezing process and of a thickness sufficient to allow rapid transfer of heat and extensibility;

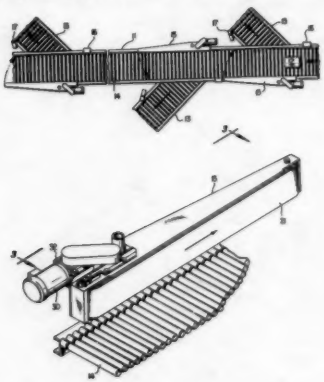
the space between a pair of said pockets exceeding the space occupied by an interfitting pocket of a superposed package sufficient to allow for the expansion of the pockets during the freezing of the contents and to permit the circulation of cooling fluid during transport or storage.

4,711,357

AUTOMATED SYSTEM AND METHOD FOR TRANSPORTING AND SORTING ARTICLES

Keith A. Langenbeck, 3112 Purdue St., Dallas, Tex. 75225, and David A. Holdeman, Highland, Ill., assignors to Keith A. Langenbeck, Dallas, Tex.

Continuation of Ser. No. 644,554, Aug. 27, 1984, abandoned.
This application Dec. 18, 1985, Ser. No. 810,885
Int. Cl.[4] B07C 5/36
U.S. Cl. 209—565 **9 Claims**



1. A control system for an article conveyor, said article conveyor having a primary track on which articles are initially loaded, a plurality of secondary tracks intersecting the primary track at selected locations therealong and diverter means associated with each of said secondary tracks for diverting articles to respective ones of said secondary tracks, said control system comprising:

means for entering into said control system track information for each article corresponding to the particular secondary track to which each article is to be diverted;

means for inputting and storing said track information for each article in parallel substantially simultaneously at selected ones of a plurality of discrete locations in said storage means, each of said discrete locations being associated with a corresponding one of said secondary tracks so that track information for each article on the primary track is stored in parallel substantially simultaneously in only those discrete locations which are associated with the particular secondary track down which the article will be diverted and those secondary tracks which intersect the primary track upstream of the particular secondary track down which the article will be diverted and each discrete location has stored therein track information for those articles which will arrive at the corresponding secondary track in a sequence corresponding to the sequence in which said articles will arrive at the corresponding secondary track;

detector means positioned in proximity to respective ones of said diverter means at selected locations along said primary track for detecting the presence of articles at said selected locations and for generating respective electrical signals indicative thereof, each of said detector means being associated with a corresponding one of said diverter means and said secondary tracks;

means for comparing track information for the article which will be first to arrive at each secondary track with the identity of that particular secondary track; and

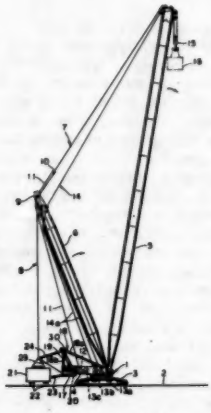
means responsive to said electrical signals generated by said detector means for selectively operating the diverter means to position each of the diverter means to divert said first article to arrive at the corresponding secondary track to the corresponding secondary track when the track information for said first article matches the identity of the corresponding secondary track, irrespective of the actual location of said first article on said primary track, and alternatively to position each of the diverter means to allow said first article to continue along the primary track when the track information for said first article does not match the identity of the corresponding secondary track.

4,711,358

COUNTERBALANCING TYPE CRANE

Keiichi Konishi, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 24, 1986, Ser. No. 832,411
Claims priority, application Japan, Mar. 4, 1985, 60-42426
Int. Cl.[4] B66C 23/72
U.S. Cl. 212—178 **2 Claims**



1. A counterbalancing type crane, comprising:

a crane body which comprises a travelling unit and a swing unit,

a tiltable boom mounted on said crane body for hanging a load through a hoisting line;

a tiltable mast mounted on said crane body;

a boom guy line disposed between an upper portion of said mast and an upper portion of said boom, said boom guy line being changeable in length;

a mast guy line attached at an upper end thereof to the upper portion of said mast;

a gantry disposed at a rear portion of said swing unit and having a mounting portion located an an upper portion thereof; and

a counterweight car with a counterweight placed thereon;

connecting arm means for vertically pivotably and removably connecting said counterweight car to the rear portion of said swing unit;

a strut connected between an upper portion of said counterweight car and an upper portion of said gantry;

a guy rope connected between the upper portion of said counterweight car and said swing unit below the gantry, wherein a lower end of said mast guy line is attached to

said counterweight car so as to be detachable therefrom and attachable to said mounting portion of said gantry.

4,711,359

CONTAINER SUCH AS A NURSING CONTAINER, HAVING PROTECTION COMPARTMENT FOR DISPENSING MEMBER

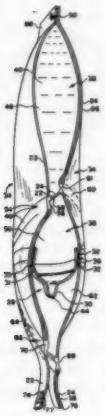
Leonard A. White, Gurnee, and Peter C. Carveth, Glen Ellyn, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,414

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[4] A61J *9/00*; B65D *25/08, 85/72*

U.S. Cl. 215—11.1 **18 Claims**



1. A nursing container comprising:

(a) a first sheet;

(b) a second, diaphragm sheet sealed about at least a portion of its periphery to said first sheet and to a third sheet, said second, diaghragm sheet being intermediate said first sheet and said third sheet;

(c) said first sheet and said third sheet sealed about their entire peripheries and including the exterior wall of said container;

(d) nipple means including a base and a nipple, between said first and second sheets, said first and second sheets being secured to the periphery of said base at a base seal;

(e) said sheets defining a storage chamber on the base-side of said nipple means;

(f) a manually breakable line of securement between said first sheet and said second, diaphragm sheet in said storage chamber, extending across said storage chamber, subdividing said storage chamber into a storag.: compartment for the storage of a substance to be delivered to said nipple and a protection compartment adjacent said nipple means to segregate the stored substance from said nipple means; and

(g) a permanent line of securement between said second and third sheets in said storage chamber, extending substantially parallel to, and substantially the length of, said storage chamber breakable line of securement.

5. A container for a substance, comprising:

(a) a first sheet;

(b) a second, diaphragm sheet sealed about at least a portion of its periphery to said first sheet and to a third sheet, said second, diaphragm sheet being intermediate said first sheet and said third sheet;

(c) said first sheet and said third sheet sealed about their entire peripheries and including the exterior wall of said container;

(d) access means including a base and a dispensing member, between said first and second sheets, said first and second sheets being secured to the periphery of said base at a base seal;

(e) said sheets defining a storage chamber on the base-side of said access means;

(f) a manually breakable line of securement between said first sheet and said second, diaphragm sheet in said storage chamber, extending across said storage chamber, subdividing said storage chamber into a storage compartment for the storage of a substance to be delivered to said dispensing member and a protection compartment adjacent said access means to segregate the stored substance from said access means; and

(g) a permanent line of securement between said second and third sheets in said storage chamber, extending substantially parallel to, and substantially the length of, said storage chamber breakable line of securement.

4,711,360

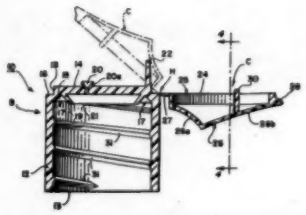
SPLASH-PROOF CLOSURE

Myron Ullman, Canfield, Ohio, assignor to Boardman Molded Products, Inc., Youngstown, Ohio

Filed Feb. 26, 1987, Ser. No. 22,927

Int. Cl.[4] B65D *43/16*

U.S. Cl. 215—235 **8 Claims**



1. A plastic closure, primarily useful in conjunction with viscous liquid holding containers, comprising:

a body portion including a tubular skirt having a longitudinal axis, an open bottom and a closed upper wall, said skirt having an internal periphery and an external periphery, said upper wall having an external diameter and including a top surface and a bottom surface, and a dispensing aperture extending through said upper wall, said tubular skirt forming an annular shoulder at its upper end extending about said upper wall;

a cap portion, integrally formed on said body portion, including a tubular wall having a central axis, an open bottom end and a closed domed upper wall having an apex, said tubular wall having an internal diameter slightly larger than the external diameter of said body portion upper wall to provide a tight mating fit therebetween, and the bottom end of said tubular wall being adapted to seat on said annular shoulder;

a hinge, located in a plane perpendicular to said axes, for integrally joining said cap portion to said body portion, and including a thinned hinge line between said cap portion and said body portion, for allowing said cap portion to rotate thereabout close on said body portion;

a cap-stopping resilient post, integrally formed on said skirt upper wall adjacent the peripheral edge of said upper wall and extending upwardly vertically and parallel to said longitudinal axis, for preventing the movement of said cap portion toward the dispensing aperture when the closure is uncapped;

cam means, integrally formed as part of and defined by a portion of said domed upper wall lying between said hinge and said apex, for bending said cap-stopping post to an approximately 45° angle relative to said skirt upper wall

when said cap portion is closed on said body portion and for stopping against said cap-stopping resilient post when the closure is uncapped, said cam means being in a plane located approximately 45° above said skirt upper wall when said cap portion is closed on said body portion;

finger-tab means, integrally formed on said tubular wall located opposite said hinge to extend radially outwardly from said tubular wall in a plane perpendicular to said central axis, for providing a region to grasp said cap portion for movement on or off of said body portion; and

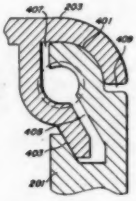
closing post means, integrally formed on said domed upper wall in the region between said apex and said finger-tab means and extending vertically downwardly parallel to said axes, for reception within said dispensing aperture when the closure is capped; said closing post, the dispensing aperture, said cap-stopping resilient post, said cam means and said finger-tab means all lying along a line extending through and perpendicular to the axis of said hinge.

4,711,361

INTERLOCKING MODULE HOUSING

Nicholas Mischenko, Mount Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1986, Ser. No. 858,418
Int. Cl.[4] B65D *6/24*
U.S. Cl. 220—4 F **9 Claims**



1. An interlocking corner joint for adjacent sides of an enclosure enabling the adjacent sides to be slidably mated at their edges, comprising:

an inward curving edge of a first side having a first radius of inside curvature;

an inward curving edge of a second side having an inside curvature second radius unequal to said first radius, whereby said curving edges may be concentrically nested along the length of said edges;

a flange disposed adjacent said inward curving edge of the first side, on the same first side surface as said inside curvature, and spaced from said first side edge beyond a point where said inside curvature ceases, said flange having a curved portion curved toward said first side edge and a first lip portion at the end of said curved portion extending essentially away from said first side edge; and

a second lip forming a groove adjacent said inward curving edge of said second side and on the same second side surface as said inside curvature, said second lip and groove shaped to receive said first lip portion when said curving edges are concentrically nested.

4,711,362

MODIFIED END CAP FOR THERMOPLASTIC CONTAINER

William H. Korcz, Houston, Tex., and Surendra N. Singhal, Tulsa, Okla., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 22, 1986, Ser. No. 909,539
Int. Cl.[4] B65D *41/02*
U.S. Cl. 220—67 **5 Claims**

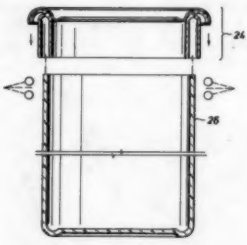
1. A modified end cap for a food or beverage thermoplastic container, which may be attached to a thermoplastic container sidewall without the necessity of flaring the thermoplastic sidewall of said container, which comprises:

a suitable metallic end; and

a metallic ring clip which is attached to the under portion of said end so that said ring clip can attach to the sidewalls of a thermoplastic container, said ring clip comprising:

a first wall having a first edge and a second edge;

a second wall having a first edge and a second edge, said second wall being positioned outside of and adjacent to said first wall;



a third annular wall positioned substantially perpendicular to said first wall and said second wall, and having an inner and outer edge, where said inner edge is connected to said first edge of said first annular wall, and said outer edge is connected to said first edge of said second annular wall;

a fourth annular wall having an inner and outer edge, where said inner edge of said fourth annular wall is connected to said inner edge of said third annular wall; and

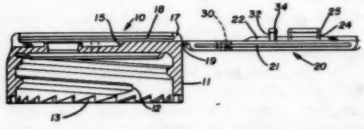
wherein said first and second annular walls are arranged concentric to a central longitudinal axis.

4,711,363

TAMPER EVIDENCE CLOSURE

Michael Marino, New Castle, Pa., assignor to West Penn Plastic, Inc., New Castle, Pa.

Filed May 1, 1987, Ser. No. 44,786
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—266 **6 Claims**



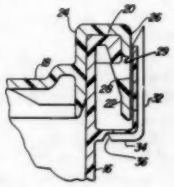
1. A tamper evident closure comprising a top portion having an annularly depending flange and means thereon for attachment to a container, said top portion having an dispensing opening therethrough, lock means on said annular depending flange securing same to said container, a multiple cap for registering with said top portion, a secondary cap movable into and away from a closed portion overlying said top portion, a tubular plug carried by said secondary cap in a position to cooperate with said dispensing opening and affect a seal therewith when said cap is in closed position, an intrical, thin flexible hinge extending from said top portion to said multiple cap, means of said multiple cap for releasing said secondary cap therefrom and hinge means formed on said multiple cap to said secondary cap, a recessed area on said top portion and a corresponding registerable elongated guide rib on said secondary cap for engagement therewith, means on said secondary cap for securing same to said top portion.

4,711,364

TAMPER-EVIDENT CONTAINER AND CLOSURE

Ilija Letica, Oxford, Mich., assignor to Letica Corporation, Rochester, Mich.

Continuation-in-part of Ser. No. 869,355, Jun. 21, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,541
Int. Cl.[4] B65D *17/40*
U.S. Cl. 220—276 18 Claims



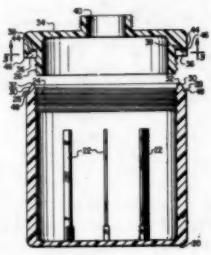
1. A container/closure combination comprising:
a container comprising a bottom and at least one side wall joined to the bottom and terminating in a peripheral seat defining an open end spaced from said bottom;
a closure for said container having an inverted generally U-shaped peripheral section which fits interlockingly over the peripheral seat of the container and includes a skirt portion which, when the closure is in place on said container, lies outside of said side wall;
means formed in said skirt portion to define at least one fracture point for splitting said skirt portion to facilitate removal thereof from the container;
said container/closure combination further comprising a tear strip removably attached thereto so as to cover and prevent access to the fracture point when said closure is in place on said container seat.

4,711,365

CONTAINER AND CLOSURE ASSEMBLY WITH FOLDING SEALING RIBS

Kenneth A. Fomby, P.O. Box 636, Gainesville, Tex. 76240

Filed Feb. 9, 1987, Ser. No. 12,252
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—288 20 Claims



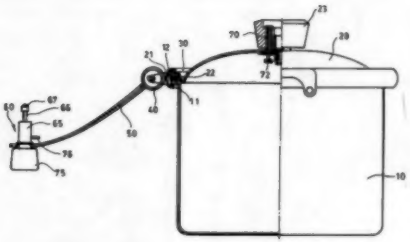
1. A container and closure assembly, comprising:
a container having an open end portion;
a closure member adapted to engage and cover said open end portion; and
cooperative means on said container and said closure member for creating a seal therebetween; said cooperative means including a spaced plurality of flexible rib members associated with one of said container and closure member and a portion of the other of said container and said closure member adapted to engage and deform said spaced plurality of rib members.

4,711,366

PRESSURE COOKER

Shin-I Chen, No. 5 Lane 102 Ho-Chiang Street, Taipei, Taiwan

Filed Jul. 28, 1986, Ser. No. 890,167
Int. Cl.[4] B65D *45/34*
U.S. Cl. 220—316 1 Claim



1. A safety pressure cooker comprising:
a cooker body;
a cover for covering said cooker body;
an elastic connector, said connector having a C-shaped cross section, adapted to extend concentrically with respect to said cover, and said connector having a first terminus and a second terminus to define an opening which can be adjusted in width for fastening and releasing said cover;
an extension plate secured at each terminus to adjust the width of the opening for fastening and releasing said cover as aforesaid;
a grooved cam, said grooved cam having two symmetrical spiral guiding slots;
a center shaft passing through each extension plate of said connector and mounted with sliding fit so that rotation of said grooved cam will cause each extension plate to move subject to guiding by said two symmetrical spiral guiding slots to said grooved cam;
an operating handle connected to said grooved cam for turning said grooved cam, flexible, with a hole at one end;
a valve seat on said cover;
a relief valve movably installed in the hole of said operating handle, composed of (a) a valve body defining a valve seat, (b) a rod extending horizontally outside said valve body and including a tapered valve subject to thrust of a respective spring and normally contacting said valve seat for tightly closing said relief valve, and (c) a spring located in said valve body; and
two safety pins on said cover, rising to a high position when pressure in the cooker is high in order to restrict movement of said rod of said relief valve such that removal of said tapered valve from said valve seat is substantially precluded and opening of said cover is prevented.

4,711,367

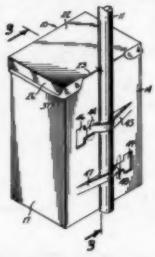
TRASH CONTAINER

Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Filed Nov. 1, 1985, Ser. No. 793,848
Int. Cl.[4] B65D *90/04, 90/12, 5/60, 5/34*
U.S. Cl. 220—404 17 Claims

1. A container having a chamber accommodating a bag comprising: a box having front, rear, and side walls providing a chamber, said walls having upper edges surrounding an open top, cover means movably connected to the upper edge of the rear wall with hinge means for selectively opening and closing the open top, said cover means having a top wall and front and side flanges joined to the top wall, said front and side flanges extended over upper portions of the front and side walls of the box when the cover means is in the closed position over the open top of the box, said box, cover means and hinge means are folded and shaped from a single sheet member having fold lines

to facilitate folding and shaping of the box and cover means, said hinge means having opposite ends, inwardly directed slots aligned with said opposite ends of the hinge means, said rear wall having downwardly directed slits open to the slots, said slots and slits accommodating separate portions of a bag when located in the chamber to hold the bag in engagement with the upper edges of the walls of the box, said inwardly directed slots being between the upper edge of the back wall of the box and the top wall of the cover means, said hinge means including the fold line between the back wall of the box and the top wall of the cover means whereby the cover means is integral with the back wall of the box, a plurality of strap means joined to the rear wall to couple the box to a fixed object, each of said strap means having a first end joined to the rear wall and a second end having an enlarged cross head means, and a plurality of generally T-shaped slot means in the rear wall aligned with the strap means, said cross head means extendible through a T-shaped slot means and engageable with the rear wall to form loops used to couple the box to a fixed object.



4,711,368

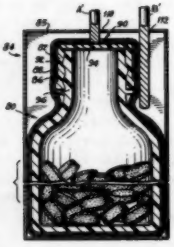
TAMPER PROOF PACKAGE WITH ELECTRICAL CIRCUIT

Leon Simons, 303 E. 57th St. Apt. 47-E, New York, N.Y. 10022

Continuation-in-part of Ser. No. 850,327, Apr. 11, 1986, abandoned. This application Jul. 9, 1986, Ser. No. 883,245

Int. Cl.[4] B65D *55/02*

U.S. Cl. 220—450 **7 Claims**



1. A tamper-proof package for enclosing material, the package comprising:

container means for holding material, the container means having an opening through which the material may be inserted and removed;

closure means coupled to the container means for closing the opening;

circuit means having an electrical resistance of known value located on at least one of the container means and the closure means, the circuit means being so positioned that the tampering with the container means will alter the known value of the circuit means; and

terminal means connected to the circuit means on the exterior of at least one of the container means and the closure means for testing the resistance of the circuit means wherein the circuit means further comprises:

an enclosure having a first conductive layer in which at least the container means is enclosed;

a layer of insulating material extending over the first conductive layer; and

a second conductive layer extending over the insulating layer, the known value of the resistance of the circuit means comprising a substantially open-circuit value when the envelope has not been tampered with, the open-circuit value being altered to a substantially short-circuit value when the envelope has been tampered with.

6. A tamper-proof package for holding material comprising:

container means including a receptacle for holding material and a closure member;

envelope means enclosing the container means for detecting tampering therewith, the envelope means comprising an enclosing surface having a first layer of conductive material, a second layer of insulating material, and a third layer of conductive material, at least one of the layers of conductive material being extrudable into contact with the other layer of conductive material through the layer of insulating material when the enclosing surface is penetrated; and

means for making electrical connection to the conducting layers to determine whether or not the conductive layers are in contact with each other.

4,711,369

TAB DISPENSING AND ATTACHING APPARATUS

Daniel Duchin, Long Island, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 654,062, Sep. 25, 1985, Pat. No. 4,610,384, which is a continuation-in-part of Ser. No. 553,080, Nov. 18, 1983, Pat. No. 4,610,385. This application Feb. 14, 1986, Ser. No. 829,367

Int. Cl.[4] B65H *3/22*

U.S. Cl. 221—213 **20 Claims**

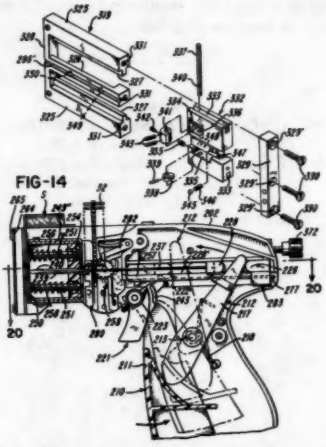


FIG-14

1. A tag feed mechanism adapted to use in a hand-held tag attacher of the type having a manually operated actuator, said mechanism comprising: means for moving a tag from a position remote from the attacher to a position in alignment with the attacher; means for applying a driving force to said tag moving means to move same in response to the actuation of the actuator; said tag moving means comprising a feed pin for engaging a tag and means for movably mounting the feed pin, means for mountng the feed pin for relative movement on and with respect to the mounting means, said feed pin being actuated by the application of said driving force to said feed pin to move the mounting means and the feed pin from said remote position to said aligned position; and means for resisting movement of said mounting means until said feed pin has moved relative to said mounting means into engagement with the tag.

4,711,370

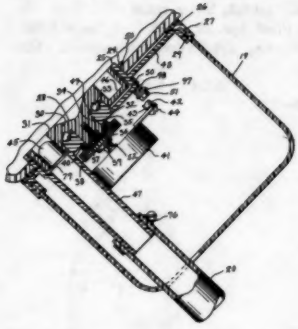
SEAL MEMBER FOR PELLET DISPENSER

Paul R. Goudy, Jr., and William G. Weekley, both of Milwaukee, Wis., assignors to Autotrol Corporation, Milwaukee, Wis.

Continuation of Ser. No. 655,906, Sep. 28, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,201

Int. Cl.[4] B65G 59/06

U.S. Cl. 221—265 2 Claims



1. A seal member for a rotor assembly comprising:

a rotor member including passages for the movement of particulate material therethrough;

a housing providing a supporting surface;

a shaft member connected to said rotor member and extending from said housing;

a gear secured to said shaft member; and

a seal member operatively positioned between said gear and said housing, said seal member encompassing the area of said shaft extension from said housing, said seal member constructed in a manner and of a material to provide both an enclosure of said area and a biasing of said gear away from said housing;

wherein said gear and said shaft have angled surfaces to mate with respective inner and outer portions of said seal member with said seal member biased therebetween.

4,711,371

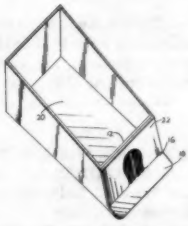
CARD DISPENSER GUARD APPARATUS

Donald R. Harrigan, R.D. 4, Box 243, English Creek Rd., McKee City, N.J. 08232

Filed Jul. 10, 1986, Ser. No. 884,016

Int. Cl.[4] A47F 1/12; A63F 1/10

U.S. Cl. 221—310 7 Claims



1. A card-dispenser guard apparatus for a playing-card dealing shoe, said apparatus comprising a plate having a front side, a back side, and an opening therethrough, said opening having disposed therein a flexible closure means partable along a vertical axis thereof, wherein the flexible closure means comprises a plurality of closely adjacent tensioned strands which extend from the perimeter of the opening and whose ends meet along a vertical axis of the opening essentially mid-way between the lateral sides of said opening to thereby provide right strands extending from the right perimeter and left strands extending from the left perimeter of the opening.

4,711,372

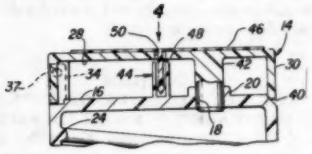
TAMPER INDICATING CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Feb. 2, 1987, Ser. No. 9,676

Int. Cl.[4] B65D 41/32, 47/08, 55/06

U.S. Cl. 222—23 16 Claims



1. A tamper indicating dispensing closure for attachment to a container comprising, in combination: a base cap having a top with a dispensing orifice therethrough and with an upwardly projecting retention sleeve thereon and a depending annular skirt having means for attachment to a container; a lid attached to said base cap by a hinge for movement between an open dispensing position and a closed position covering said dispensing orifice; and a tamper indicating disk having a pin projecting therefrom extending through an aperture in said lid and into engagement with said cap retention sleeve when said closure is initially attached to a filled container with said lid in the closed position, said disk being a member separate from the lid, said disk having a frangible area circumscribing said pin; whereby when said lid is initially opened, the pin will be retained by said sleeve breaking away from said disk at said frangible area thereby indicating tampering or initial opening.

4,711,373

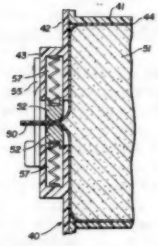
PORTABLE DISPENSING SYSTEM

William C. Christine, Catasauqua, Pa., assignor to Trinity Foundation, Nazareth, Pa.

Continuation-in-part of Ser. No. 850,034, Apr. 10, 1986, abandoned. This application Jun. 2, 1986, Ser. No. 869,341

Int. Cl.[4] B65D 85/72; G01F 11/00

U.S. Cl. 222—82 7 Claims



1. A portable dispensing system comprises:

a hollow body having a first and second open end, said hollow body receiving a flexible pouch comprising a main body made of a flexible material and a flexible discharge portion integral with said main body, said pouch being filled with a flowable material;

a head removably mounted at said first end of said body and having an opening therethrough;

piston means mounted at said second end of said body for applying pressure to the flowable material in said pouch; said head including valve means adapted for opening in response to pressure created by said piston means acting on said flowable material in said pouch means, said valve means being mounted on said head adjacent said opening and comprising a casing, jaw means movably mounted on said casing for reciprocable movement between opened and closed positions, said discharge portion of the pouch passing through said opening of said head and being engaged by said jaw means, biasing means normally urging said jaw means to the closed position thereby closing said pouch and said biasing means yielding due to pressure increases on said pouch by said piston for the discharging of said flowable material.

4,711,374

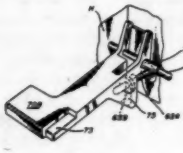
LOW-COST POST-MIX BEVERAGE DISPENSER AND SYRUP SUPPLY SYSTEM THEREFOR

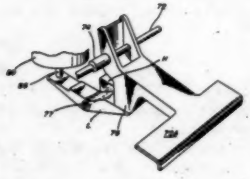
Loraine E. Gaunt, Marietta; Samuel C. Crosby, Decatur; William J. Saunders, Stone Mountain, and Robert D. Bruffey, Jr., Lilburn, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 775,833, Sep. 13, 1985, Pat. No. 4,635,824. This application Sep. 16, 1986, Ser. No. 907,821

Int. Cl.[4] B67D *5/56*; E03B *3/00*

U.S. Cl. 222—129.1 **1 Claim**





1. A valve assembly for selectively dispensing a carbonated post-mix beverage or carbonated water alone from a post-mix beverage dispenser comprising:

(a) a syrup valve connected to a syrup supply;

(b) a soda valve connected to a source of carbonated water; and

(c) valve actuator means including a first lever for opening said soda valve and a second lever for opening said syrup valve, said first and second levers having pivot ends mounted on a pivot shaft and manually engageable actuation ends, said actuation ends being disposed in substantially the same plane, a portion of the actuation end of said first lever underlying a portion of the actuation end of the second lever in the direction of actuation, said second lever also having a protrusion in between said actuation end and said pivot end, said valve actuator means further comprising a rocker layer mounted about a second pivot shaft for operatively engaging the protrusion of said second lever, wherein said second pivot shaft lies below and substantially parallel to said first pivot shaft, whereby upon depression of said second lever the protrusion causes said rocker lever to pivot about said second pivot shaft and open said syrup valve causing syrup to be dispensed for mixing a post-mixed beverage;

whereby said first lever may be actuated independently of said second lever to open said soda valve, but actuation of said second lever also actuates said first lever, causing both said syrup and soda valves to open.

4,711,375

DEVICE FOR TREATING BURN AND SCALD WOUNDS

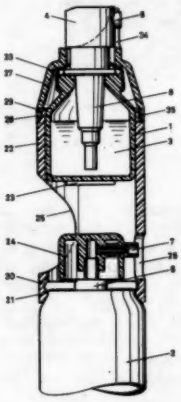
Karl Müder, Pfaffikon; Guido Schönenberger, Reinach, and Carlo A. Buzzi, Zurich, all of Switzerland, assignors to IDC-Chemie AG, Zurich, Switzerland

Filed Apr. 29, 1986, Ser. No. 856,990

Claims priority, application Switzerland, May 17, 1985, 2123/85

Int. Cl.[4] B67D *5/52*

U.S. Cl. 222—135 **1 Claim**



1. A device for treating burn and scald wounds comprising:

a first container (1) which contains water (3) and has an operating button (4) of a pump (8), with a first spray nozzle (5) for spraying the water;

a second container (2) which contains a coolant and has a separate valve (6) with a second spray nozzle (7) which is aligned approximately parallel with the first spray nozzle;

a housing (22) connecting the first and second containers in coaxial relation with the first container positioned above the valve (6) of the second container, the housing snapping onto the second container and the housing having an access opening (25) for operating the valve (6) and a slit opening (26) diametrically opposite the access opening (25), the second spray nozzle projecting into the slit opening (26); and

a snap-on guide cap (27) holding the first container (1) in the housing (22) and having a guide slit (34) into which the first spray nozzle (5) projects, the guide slit (34) being aligned with the slit opening (26).

4,711,376

DISPENSING PISTON-COCK FOR ICE CREAM MAKING MACHINES

Ezio Manfroni, Sasso Marconi, Italy, assignor to Carpigiani Bruto Macchine Automatiche, Italy

Filed Jul. 15, 1986, Ser. No. 885,680

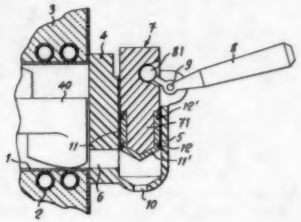
Claims priority, application Italy, Jul. 26, 1985, 15217/85[U]

Int. Cl.[4] B67D *5/62*

U.S. Cl. 222—146.1 **5 Claims**

1. In a dispensing piston-cock for use in ice-cream machines having means for heating the ice-cream mix to a pasteurizing temperature, and means for refrigerating the ice-cream mix, and of the kind comprising a baseplate made of plastics material; a cylinder made of plastics material open at its upper end and provided with an ice-cream dispensing hole at its opposite

or lower end; said cylinder being integral with or formed in said baseplate; at least one communication duct formed in said baseplate and opening in proximity of the lower end of said cylinder; a piston made of plastics material slidably mounted in said cylinder; at least two spaced sealing rings on the lower end portion of said piston; means for reciprocating said piston in said cylinder from a first position wherein it closes said communication duct with its lower end portion, to a second position wherein its lower end portion is lifted above said communication duct; the improvement according to which the said piston is covered at least over its lower end portionn by a metal jacket, which metal jacket extends up along the piston to a height above the communication duct so that the jacket covers the communication duct when the piston is in said first position at which it covers the communication duct, such that during the heating of the ice-cream mix the heat is conducted, by means of said metal jacket, to the interior walls of the cylinder.

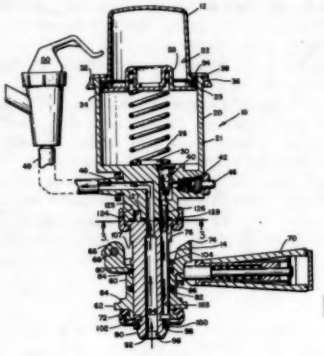


4,711,377

COUPLER AND PUMP FOR A BEVERAGE DISPENSER

Anthony D. Brown, Woodland Hills, Calif., assignor to Grundy Dispense Systems, Inc., Canoga Park, Calif.

Filed Feb. 24, 1986, Ser. No. 832,309
Int. Cl.[4] B67D *1/04*
U.S. Cl. 222—400.7 **13 Claims**



1. A coupler and pump for dispensing a beverage from a container having a valve, comprising:

a. an air pump;

b. a coupler;

c. said air pump further comprising a pump housing including an interior cylinder having a floor and the pump housing including a base;

d. a piston retained within said cylinder of said pump housing for providing a source of compressed air;

e. means for returning said piston to the top of its stroke, the returning means being retained within said pump housing;

f. an air passage extending from the floor of said cylinder through the base of said pump housing;

g. a beverage passage within said base of said pump housing;

h. said coupler further comprising a coupler housing including a central cylindrical bore therein;

i. a substantially cylindrical probe movably seated within said cylindrical bore of said coupler housing, wherein said probe further includes a probe head for sealing engagement with the valve of a container of beverage, a top-end remote from said probe head, a first flange adjacent the top end of the probe, a second flange delineating the end of said probe head, a recess adjacent said second flange, a central longitudinal beverage passage, an air passage parallel to but offset from said beverage passage, said air passage running from the top end of the probe to said recess adjacent to said second flange, and means for sealing said air passage and said beverage passage of said probe head relative to the container valve and from each other;

j. means for actuating said movable probe;

k. means for rotatably joining said coupler to a container valve;

l. means for aligning said air and beverage passages in said probe with said air and beverage passages in said base, respectively and preventing rotation of said probe relative to said air pump; and

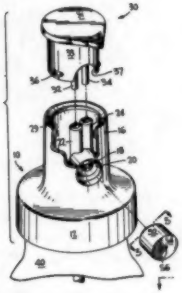
m. means for joining the base of said air pump to the top end of said probe.

4,711,378

SPRAY CAP ASSEMBLY COMPRISING A BASE UNIT AND PUSH/PULL CLOSURE MEANS

John J. Anderson, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Mar. 24, 1986, Ser. No. 842,969
Int. Cl.[4] B65D *25/38*
U.S. Cl. 222—499 **4 Claims**



1. A spray cap assembly for attachment to a resilient container comprising a base unit including a skirt portion for attachment to a resilient container, an annular sidewall portion positioned above said skirt portion integral therewith, a discharge chamber recessed into said sidewall portion, an orifice in said discharge chamber extending through said annular sidewall portion, a separation wall within said annular sidewall portion and extending at right angles to said annular sidewall, first and second parallel tubular passages extending through said separation wall, the first of said passages having an opening therein to place said passage in communication with said orifice and the second of said passages having an opening therein to place said passage in communication with said discharge chamber; an insert in said discharge chamber having a dispensing hole to form a product-air mixing chamber behind said insert, said hole being in communication with said orifice and with the opening in the second passage; a push/pull closure comprising a closed end, an annular closure sidewall extending downwardly from said closed end, said annular closure sidewall being positioned within said annular sidewall portion of said base unit, and parallel posts extending down-

wardly from said closed end within said annular closure sidewall mated to and positioned within said first and second passages of said base unit; said base unit and closure being constructed and arranged whereby when said closure is in an open position said tubular passages are in communication with said orifice and discharge chamber through said openings therein and when said closure is in the closed position said openings in said tubular passages are sealed, and whereby said annular closure sidewall and the base unit annular sidewall portion cooperate to guide and limit movement of said closure between the open and closed positions.

4,711,379

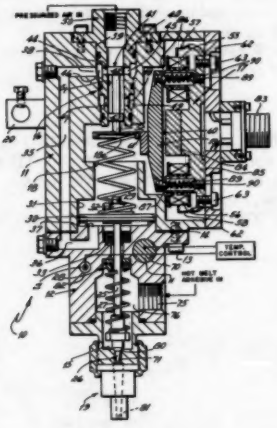
PROPORTIONAL FLOW CONTROL DISPENSING GUN

Richard P. Price, Parma Heights, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 719,415, Apr. 3, 1985, abandoned. This application Mar. 17, 1986, Ser. No. 840,501

Int. Cl.[4] B67D *5/00*

U.S. Cl. 222—504 **2 Claims**



1. Proportional flow fluid dispensing apparatus comprising:

a piston;

a flow control valve means having a valve stem operably connected to said piston for controlling the flow of the fluid;

a passageway for pressurized air opening to one side of the piston;

an air valve means for controlling the flow of pressurized air into said passageway;

a direct mechanical spring feedback means;

a linear effort electric torquemotor means operably disposed in a position between said mechanical spring feedback means and said air valve means for directly stroking said air valve means, said direct mechanical spring feedback means being operably disposed between said piston and said linear torquemotor means for positioning said air valve means to block said passageway after said valve stem has been moved to a position linearly corresponding to the force exerted by said torquemotor,

wherein said air valve means comprises a valve body and a balanced, three land spool reciprocally mounted in said valve body, said valve body having an exhaust port, a supply port and a load port, the outermost of such lands being directly exposed on outwardly facing sides to atmospheric pressure, and the innermost of such lands adjacent said load port, said innermost land selectively sealing such load port and wherein one face of said innermost land is directly exposed to said supply port and one face of said innermost land is directly exposed to said exhaust port.

4,711,380

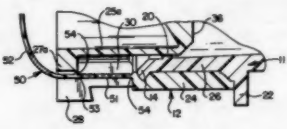
TAMPER-EVIDENT SEAL FOR A TOGGLE-TYPE DISPENSING VALVE

John G. Ulm, Upper Sandusky, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio

Filed Aug. 18, 1986, Ser. No. 897,464

Int. Cl.[4] B65D *47/10*

U.S. Cl. 222—541 **7 Claims**



1. A dispensing valve and spout assembly comprising: a hollow tubular spout having axially inner and outer ends, a valve member formed of resiliently flexible material mounted on the outer end of the spout, said valve member having spaced, hollow tubular concentric inner and outer walls, the inner and outer walls being flexible and interconnected but spaced apart sufficiently to provide a socket, said socket receiving and engaging the outer end of the spout, part of the inner wall carrying a flexible hollow extension with an outlet, the inner wall carrying adjacent its axially-inward end a transverse wall, means on the spout for forming a first seal with the inner wall of the valve member, said outer wall having an outlet positioned axially outwardly beyond the axially outer end of the spout which said outlet of said outer wall is directed radially outwardly from the axial outer end of the spout, the hollow flexible extension projecting axially outwardlly beyond the axially outer end of the spout and the hollow flexible extension is connected to the outer wall at a closed upper outer end where the outlet of the flexible hollow extension is located and is directed radially outwardly towards the outlet in the outer wall with which it substantially aligns, a distorting member mounted on the transverse wall such that movement of the distorting member in one direction will cause flexing of both the transverse wall and the inner wall as well as said extension, thereby opening a dispensing passage to said outlet in the outer wall bounded by the inner wall, the spout and the extension of the inner wall, means forming a combination of an anti-tampering structure and a second seal between the valve member and the spout comprising a tear-off tab sealed in said outlet in the flexible extension to normally prevent access through that outlet into the spout and seal it to prevent leakage therethrough in case of failure at the first seal means said tear-off tab comprising an outlet covering section secured by a tear line connection to the closed upper, outer end of said extension and extending axially along the extension to which it is secured and then to the adjacent outer wall to which it is secured.

4,711,381

BICYCLE RACK WITH SAFETY LIGHT

Willie L. Felder, 2475 Elliot Ave., S., Minneapolis, Minn. 55404

Filed Jul. 11, 1986, Ser. No. 884,727

Int. Cl.[4] B62J *7/00*

U.S. Cl. 224—39 **6 Claims**

1. An illuminated bicycle rack comprising an article supporting platform having a pair of longitudinally extending, laterally spaced apart tubular article supporting stringers defining the side edges of the article support platform,

each stringer carrying a light casing at the rear end thereof, the rear end of each of the stringers having an extension connected thereto to define said light casing and supported solely by the rearward end of the stringer,

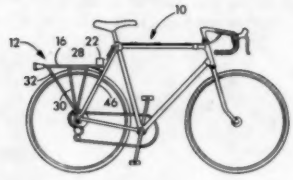
each extension projects rearwardly from the stringer and has a forward end affixed to the rear end of the stringer, each said extension enclosing and supporting a light bulb socket adapted to receive a bulb,

said extensions for the bulb being spaced apart from one another behind the stringer and behind other portions of the rack connected to the stringers to define an open center area between the extensions thereby reducing the weight of the rack at its rear end and enhancing streamlining thereof,

each said extension having an opening at the rear end thereof,

said opening having a bulb cap thereon, said cap having a transparent lens therein, whereby light from the bulb can be directed rearwardly of the rack,

battery support means mounted upon the rack and connected to the stringers in the vicinity of the forward ends of the stringers,



at least one electrical conductor extending through each of the hollow stringers between the light casing and the battery support means whereby the stringers support both the battery support and the lights and protect the conductors extending therebetween,

brace members extending horizontally between the stringers and connected thereto to establish the spacing therebetween, and

legs extending from the stringers downwardly and said legs being adapted to be connected to the framework of the bicycle to support the rack.

4,711,382

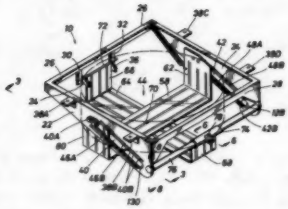
SPARE TIRE CARRIER

David L. Helterbrand, 3508 University Dr., Garland, Tex. 75043

Filed Oct. 17, 1986, Ser. No. 920,274

Int. Cl.[4] B62D *43/00*

U.S. Cl. 224—42.23 **16 Claims**



1. Apparatus adapted for supporting a spare tire on an underside of a vehicle, comprising:

a pair of spaced apart track members attachable to the underside of the vehicle, said track members each having an inclined path of travel;

a carriage having a front end directed toward the front end of the vehicle, and a rear end directed toward the rear end of the vehicle, said front end and said rear end of said carriage being spaced apart a sufficient distance to enable attachment of a spare tire to said carriage;

means for movably mounting said carriage to the inclined path of travel of said track members, said carriage being pivotally movable relative to said track members between a retracted tire storage position and an extended position for providing convenient access to the spare tire; and

a guide pin fixed to said carriage and engageable with said inclined path of travel of said track members for limiting the pivotal movement of said carriage with respect to said track members.

4,711,383

CLOTHES HANGER CARRIER AND STORAGE CONTAINER

James E. Jenkins, 84678 Laughlin Rd., Eugene, Oreg. 97405

Continuation-in-part of Ser. No. 757,145, Jul. 22, 1985, abandoned. This application Jun. 30, 1986, Ser. No. 929,794

Int. Cl.[4] A45F *3/02*

U.S. Cl. 224—202 **4 Claims**

1. A unitarily constructed, rigid, portable carrier for clothes hangers comprising, a, walled structure having front, rear, and bottom walls and a pair of side walls, said front wall defining and opening for the reception of hanger necks and an interior defined by said walls, each of said side walls having a stiffening channel formed by interconnecting stiffening ribs for imparting rigidity to said side walls, and, a strap for supporting said walled structure,

said strap adapted to be retained in said stiffening channel when said walled structure is supported by said strap.

4,711,384

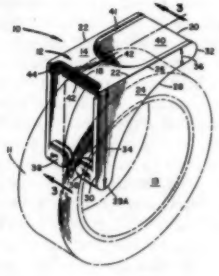
TAPE DISPENSING DEVICE

Rod W. Harris, 1011 Arlington Blvd. #907, Arlington, Va. 22209

Continuation of Ser. No. 675,328, Nov. 27, 1984, abandoned. This application Jan. 21, 1987, Ser. No. 8,046

Int. Cl.[4] B65D *85/672*

U.S. Cl. 225—66 **13 Claims**



1. A dispensing device adapted to be mounted on a core mounted roll of flexible material to facilitate manual engagement of the roll and dispensing and severing of a length of said material comprising:

a top wall having a top surface, a bottom surface, a front edge, a back edge and side edges, said front edge of said

top wall having cutting means for cutting a desired length of material to be dispensed, said top surface of said top wall having a user-engageable portion;

a side wall perpendicular to and extending downwardly from each of said side edges of said top wall, said side walls having a top edge, a bottom edge, a front edge, and a back edge, said bottom edge of said side walls curving ergonomically downwardly along a continuous concave arc from said back edge of said sidewall toward said front edge of said sidewall so that the downward extension of said side walls from said top wall is greater at said front edge of said side wall than at said back edge of said side wall thereby defining a downwardly curving continuous concave user-engageable bottom edge, said downwardly curving continuous concave arc allowing continuous opposing manual engagement of said user-engageable portion of said top surface of said top wall, said user-engageable portion of said downwardly curving continuous concave bottom edge of said side wall, and core when the dispensing device is mounted on a core mounted roll of flexible material; and

a shoulder perpendicular to and projecting inwardly from at least one of said side walls towards the other of said side walls, said shoulder terminating at a point spaced from said other side wall, said shoulder adapted to position and retain said device on said roll.

4,711,385

EXPLOSIVE POWDER CHARGE ACTUATED FASTENING ELEMENT DRIVING DEVICE

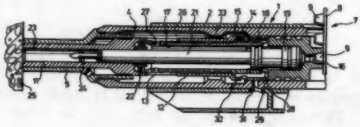
Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Nov. 19, 1986, Ser. No. 932,658

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3540953

Int. Cl.[4] B25C *1/14*

U.S. Cl. 227—10 **5 Claims**



1. Explosive powder charge actuated fastening element driving device comprising a housing, an axially elongated tubular piston guide located within said housing and forming a guide bore having a first end and a second end, a driving piston displaceably mounted within said guide bore, a firing chamber located at the first end of said guide bore for receiving an explosive powder charge so that upon firing the charge propellent gases are generated and directed against said piston for displacing said piston in the direction from the first end toward the second end, said piston guide is spaced inwardly from said housing for at least an axially extending portion spaced between the first and second ends of said bre and forming a channel, said piston guide having a first aperture and a second aperture extending radially therethrough and communicating between said guide bore and said channel, said first aperture and said second aperture are spaced apart in the axial direction of said piston guide with said first aperture located closer to and spaced from the first end of said guide bore and said second aperture located closer to and spaced from the second end of said guide bore, and means located within said channel between said first and second apertures for selectively blocking flow through said channel between said first and second apertures during the operation of said driving device.

4,711,386

METHOD OF JOINING PYROLYTIC BORON NITRIDE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 15, 1986, Ser. No. 906,877

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—121 **13 Claims**

1. The method of joining a pyrolytic boron nitride article to a metal or ceramic member comprising the steps of: forming the pyrolytic boron nitride article by chemical vapor deposition; placing said article and said member in position to be brazed together with a metal alloy foil therebetween, the alloy containing titanium as an active metal in an amount of about 0.5 to 2.5 weight percent; and brazing the article to the member by heating under vacuum at a temperature at which the alloy melts.

4,711,387

METHOD OF PRODUCING PIPES WITH CRACK ARRESTERS

Boris E. Paton, ulitsa Chkalova, 41a, kv. 26; Boris I. Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109; Semen M. Biletsky, ulitsa Kopernika, 16b, kv. 24; Vladimir Y. Saenko, Kharkovskoe shosse, 18, kv. 71; Vasiliy I. Us, ulitsa Filatova, 1/22, kv. 9; Alisa I. Krendeleva, prospekt Pravdy, 72a, kv. 185; Jury P. Barvinko, Darnitsky bulvar, 9, kv. 41; Lev B. Medovar, ulitsa Anri Barbjusa, 5b, kv. 62; Nikolai B. Pivovarsky, ulitsa Marshala Yakubovskogo, 7, kv. 30, and Nikolai A. Astafiev, ulitsa Prirechnaya, 1a, kv. 96, all of Kiev, U.S.S.R.

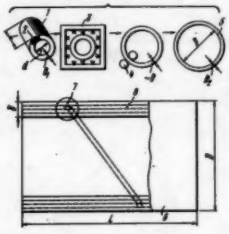
PCT No. PCT/SU84/00016, § 371 Date Aug. 12, 1985, § 102(e) Date Aug. 12, 1985, PCT Pub. No. WO85/03114, PCT Pub. Date Jul. 18, 1985

PCT Filed Mar. 21, 1984, Ser. No. 764,542

Claims priority, application U.S.S.R., Jan. 5, 1984, 3679051

Int. Cl.[4] B23K *20/04, 20/18, 31/06;* B21C *37/06*

U.S. Cl. 228—143 **1 Claim**



1. A method of manufacturing large diameter pipes with crack arresting means therein comprising the steps of fabricating a hollow cylindrical blank with a multi-layered wall and a slot extending through the entire thickness of at least one of the layers, said blank being provided with a diameter and wall thickness that are smaller and greater, respectively, than a final diameter and wall thickness of a completed pipe, applying a fusion-preventing coating to facing surfaces of selected internal layers of said cylindrical blank at least within limited areas adjacent to said slot and spaced from end surfaces of said blank, heating and rolling said multi-layered cylindrical blank on a ring rolling mill to said final diameter and wall thickness, and fusing said layers to each other while preventing the fusion of said coated facing surfaces of said selected internal layers adjacent said slot, thereby forming a multi-layered pipe with increased resistance to crack propagation under extreme operating conditions.

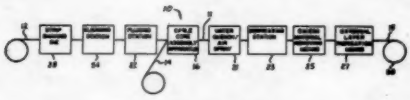
4,711,388
PROCESS AND APPARATUS FOR FABRICATING OPTICAL FIBER CABLES

Joseph Winter, New Haven, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 497,535, May 24, 1983, Pat. No. 4,555,054, which is a continuation-in-part of Ser. No. 413,846, Sep. 1, 1982, Pat. No. 4,508,423, which is a continuation-in-part of Ser. No. 324,242, Nov. 23, 1981, abandoned. This application May 20, 1985, Ser. No. 736,169

Int. Cl.[4] H04B 9/00

U.S. Cl. 228—148 **15 Claims**



1. A process for fabricating an optical fiber cable assembly having at least one optical fiber housed within a sealed metal or metal alloy tube, said process comprising:

forming a metal or metal alloy strip into a tube having a seam formed by spaced-apart tube portions;

inserting said at least one optical fiber within said tube;

sealing said seam and said tube;

said sealing step comprising providing a bath of molten metallic sealing material having a composition different from that of said metal or metal alloy forming said tube, said bath having an inlet through which said tube and said at least one fiber enter said bath and an outlet through which said tube and said at least one fiber exit said bath;

said sealing step further comprising pulling said tube with said at least one fiber through said bath of molten metallic sealing material without any protective structure between said tube and said bath to permit said tube to be in contact with said molten metallic sealing material as it travels from said inlet to said outlet and to permit the motion of said tube through said bath to cause said molten sea[l]ing material to flow into said seam and seal said tube and to form a coating about said tube; and

rapidly solidifying said sealing material after said tube exits said bath by passing said tube through a water quench.

4,711,389
SELF-SUPPORTING AND SPILL RESISTANT FOOD CARTON

Andrew J. Alba, Warwick; James A. Griesemer, Campbell Hall, and Robert L. Gordon, Monroe, all of N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation of Ser. No. 807,891, Dec. 11, 1985, abandoned. This application Sep. 9, 1986, Ser. No. 906,585

Int. Cl.[4] B65D 5/18

U.S. Cl. 229—1.5 B **3 Claims**

1. A one piece blank which may be erected into a generally hollow non-collapsible upright self-supporting carton which is storable in a nested and stacked arrangement, comprising:

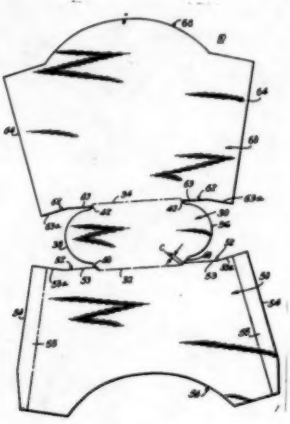
a base panel which forms a closed flat end in erected carton, said base panel including first and second generally opposing edges each bordered by a score line, and generally arcuate connecting side edges, said first and second scored edges being formed by generally parallel spaced lines;

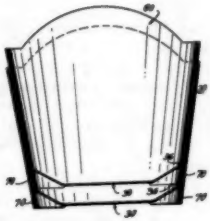
first and second upright panels respectively hingedly connected to said first and second scored edges, said first upright panel having a greater longitudinal width than said second upright panel, said first and second upright panels each including, a bottom edge, a pair of opposing lateral edges extending outwardly from said bottom edge, and a top end edge which connects said lateral edges;

each bottom edge including opposing sections which intersect and extend outwardly from said connecting side edges of the base, said sections being spaced substantially like distances inwardly from said scored base panel edges, and provided with cuts which extend from the intersection of said connecting side edges and said sections to said scored base panel edges, said cuts being contiguous to said connecting edges;

said first and second upright panels being pivoted about said scored base panel edges, and said lateral edges of said panels, respectively, being attached to form the upright carton;

said connecting base panel edges being recessed within the carton at an approximately thirty degree angle and biased against said first and second upright panels to enhance the structural integrity and maintain the configuration of the carton;





said recessed connecting base panel edges defining a shelf which facilitates storage and separation of cartons when stacked in nested relation;

said connecting base panel edges also defining vent openings between said base panel and said upright panels;

said bottom edge sections raising said closing flat carton end relative to said upright panels to provide supports and a self-standing carton feature;

said supports also enhancing the structural integrity of the carton when a plurality of such cartons are stacked in nested relation, said supports of each carton contacting and pressing downward on the side edges of an underlying carton to maintain the configuration of the cartons.

4,711,390

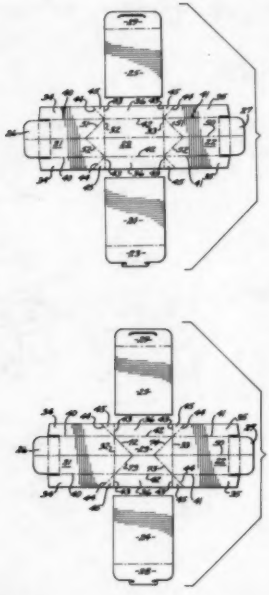
COLLAPSIBLE BOX FOR TRASH COMPACTING SYSTEM

Kenneth E. Andrews, Rancho Palos Verdes, Calif.; Gary Weingardt, Las Vegas, Nev., and James L. Durbin, Valencia, Calif., assignors to A.K.G.S., Las Vegas, Nev.

Continuation-in-part of Ser. No. 635,141, Jul. 27, 1984, Pat. No. 4,620,479. This application May 28, 1986, Ser. No. 868,131

Int. Cl.[4] B65D *5/36*

U.S. Cl. 229—41 R **8 Claims**



1. A collapsible box comprising:

a. an elongated main section with a rectangularly shaped bottom panel having front, rear and side margins and upwardly folding, rectangularly shaped front and rear panels having bottom and side margins, the front and rear panels being hingedly connected at their bottom margins to the front and rear margins respectively of said bottom panel;

b. a pair of continuous, inwardly folding flanges having inner and outer margins, with the inner margins thereof connected to the side margins of the front, rear and bottom panels of the main section, each of the inwardly folding flanges having one pair of fold lines extending from the intersection of the front and bottom panels to the outer edge of the flange, and one pair of fold lines extending from the intersection of the rear and bottom panels to the outer edge of the flange, each pair of the fold lines comprising one fold line which extends transversely across the flange, and one fold line which extends diagonally across the flange to thereby define a triangularly shaped flange section which is folded about the transverse and diagonal lines into contact with and secured to an adjacent section of the flange;

c. a pair of opposed upstanding side panels secured to the inner side of at least the portions of the continuous inwardly folding flanges connected to side margins of the front and rear panels so that the inwardly folding flanges are on the exterior of the box; and

d. a continuous medial fold line extending longitudinally along the central portion of the main section including the front, rear, and bottom panels to facilitate the folding of these panels when the box is collapsed into a flattened state.

4,711,391

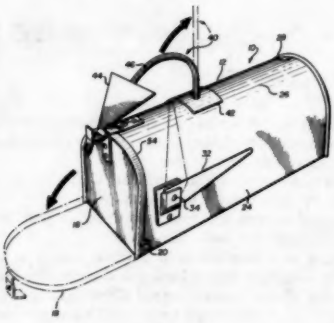
MAILBOX SIGNAL DEVICE

Paul Roge, 8 S. 510 River Dr., Naperville, Ill. 60565, and Ralph R. Roge, 6426 S. Richmond, Claredon Hills, Ill. 60514

Filed Feb. 13, 1987, Ser. No. 14,686

Int. Cl.[4] A47G *29/12*

U.S. Cl. 232—35 **9 Claims**



1. For use on a roadside mailbox having wall structure defining an enclosure open at one end and a door hinged to the wall structure to be moved between closed and opened positions relative to the open end, a signal device comprising the combination of

a base plate and a signal plate;

threaded means secured to each plate, each having an exposed end;

a helical coil spring, and said spring being threaded onto the exposed ends of the threaded means, for securing the base and signal plates resiliently together;

a tab formed off of said signal plate adjacent an edge remote from the spring, said tab being angled from the signal plate about an axis disposed transverse to the spring;

said base plate being adapted to be positioned with one face flush against the mailbox wall structure, at a location where the signal plate tab may be moved, against the flex of the spring, to a lowered position adjacent the open end of the mailbox, to be operatively held so lowered; and

adhesive means on said base plate face, adapted to secure said base plate to the wall structure at said location;

whereby said tab may be released from said lowered position automatically upon the door being opened, and said signal plate being resiliently moved to an elevated position upstanding from the base plate and wall structure, to be visible from afar.

4,711,392

MIXING VALVE APPARATUS

Yasuo Kidouchi, Yamatokouriyama, and Hiroaki Yonekubo, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 10, 1985, Ser. No. 807,525

Claims priority, application Japan, Dec. 11, 1984, 59-261159; May 31, 1985, 60-118339; Jun. 25, 1985, 60-139326

Int. Cl.[4] G05D *23/13*; F16K *29/00*

U.S. Cl. 236—12.12 **7 Claims**

1. A mixing valve apparatus for mixing hot and cold water supplied from hot and cold water lines, comprising:

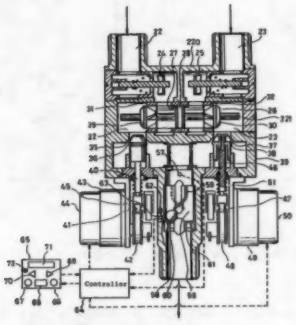
pressure balancing valve means, comprising a cylinder

formed with a plurality of apertures therein, spool means having a piston mounted on a center portion thereof for isolating a hot water passageway and a cold water passageway from each other, and two valve members having twisted fins thereon which are displaced by water flow, for equalizing respective pressures of hot and cold water, said two valve members being mounted to said spool means;

first valve means for controlling an amount of flow of hot water from said pressure balancing valve means;

second valve means for controlling an amount of flow of cold water from said pressure balancing valve means;

first motorized drifting means for moving said first valve means;



second motorized driving means for moving said second valve means;

mixing conduit means for mixing hot and cold water supplied from said first valve means and said second valve means;

temperature sensor means for detecting a temperature of mixed water mixed in said mixing conduit means;

setting means for setting a desired temperature of said mixed water; and

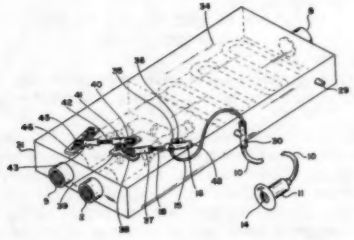
control means for controlling said first and said second motorized driving means in accordance with said temperature detected by said temperature detected by said sensor means and said desired temperature set by said setting means.

4,711,393

WATER TEMPERATURE CONTROL DEVICE

Jimmy Lee, 20 John St., Enfield, Conn. 06082

Filed Feb. 17, 1987, Ser. No. 15,081
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.15 **1 Claim**



1. A water temperature contorl device comprising:

a cold water inlet communicating sequentially with a check valve, a ball valve, and a mixing chamber;

a hot water inlet communicating sequentially with another check valve, another ball valve, and the said mixing chamber;

a tubing extending through, but not communicating with, the interior of said chamber; said tubing communicating with a temperature control cylinder housing a piston and a threaded piston rod adjustable with a vernier dial;

said tubing also communicating with a slave cylinder housing another piston and another piston rod which is connected by a linkage means to the said ball valves such that when the slave cylinder piston rod is extended, the said linkage means opens the hot water ball valve and closes the cold water ball valve; and when the slave cylinder piston rod is compressed, the said linkage means closes the hot water ball valve and opens the cold water ball valve;

a temperature-volume sensitive liquid within the said tubing, temperature control cylinder, and slave cylinder, such that a temperature increase within the said mixing chamber will increase the temperature of the said liquid-filled tubing extending through said chamber, leading to an increased volume of said liquid, thereupon compressing the slave cylinder piston;

wherein the said linkage means is comprised of:

an armature with a threaded cavity into which is screwed the end of the said slave cylinder piston rod, such rod being threaded at its extended end;

the said armature being positionally adjustable along and pivotally connected by a shoulder bolt and shoulder nut to the long section of an L-shaped plate, said L-shaped plate being firmly connected at its vertex to the rotatable axle of the said hot water ball valve;

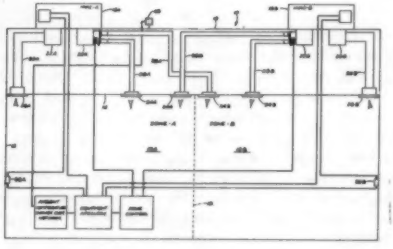
the short section of the said L-shaped plate being adjustably and pivotally connected by a shoulder bolt and a shoulder nut to another armature with a threaded cavity, which in turn is connected by a threaded rod to a third armature with a threaded cavity, the said third armature being adjustably and pivotally connected to a linear plate, said linear plate being firmly attached at one end to a rotatable axle of the said cold water ball valve.

4,711,394

MULTIPLE-UNIT HVAC ENERGY MANAGEMENT SYSTEM

Glenn W. Samuel, 557 Crest Ave., Elk Grove, Ill. 60007

Filed Feb. 26, 1987, Ser. No. 19,417
Int. Cl.[4] F24F *13/06*
U.S. Cl. 236—49 **12 Claims**



11. An energy management system for use with two HVAC units for conditioning two interconnected zones, each zone having first and second supply diffusers for discharging conditioned air from the respective HVAC unit and a return diffuser for returning air back to such HVAC unit; and stat means in each zone signaling a demand for conditioned air and for operating the HVAC unit for such zone; the improved combination of

the separate zones and the respective HVAC unit, being paired, including having an additional supply air diffuser

in each zone, and means connecting such additional diffuser in each zone with the HVAC unit for the other zone;

thermostat means to sense the outside ambient temperature, and a control operable when such outside ambient temperature is outside of a specific temperature range to render the energy management system inoperable;

first valve means connected between each HVAC unit and the additional diffuser in the other zone, for selectively opening and closing air flow from such HVAC unit to the other zone;

second valve means connected between each HVAC unit and the second supply diffuser in its zone, for selectively opening and closing such second diffuser;

means for locking out the operation of the HVAC for the other zone, responsive to the thermostat means signaling a demand in the first of either paired zone and for operating the HVAC unit for such first zone; and

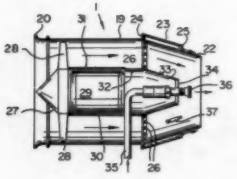
means for opening the first valve means of the operating HVAC unit of the first zone for diverting some of the conditioned air flow from such unit to the other zone, and for closing the second valve means of the operating HVAC unit of the first zone for reducing conditioned air flow from such unit to its zone, responsive to the subsequent but concurrent demand for conditioned air in the other zone.

4,711,395

METHOD AND APPARATUS FOR MAKING SNOW

Louis Handfield, 95, Sault Au Matelot, #5, Quebec City, Quebec, G1K 3Y9, Canada

Filed Dec. 13, 1985, Ser. No. 808,506
Int. Cl.[4] F25C *3/04*
U.S. Cl. 239—14.2 **7 Claims**



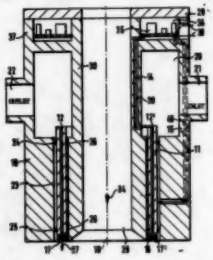
1. A machine for making artificial snow comprising elongated, cylindrical, tubular outer casing means; elongated, cylindrical, tubular inner casing means in and coaxial with said outer casing means; fan means carried by said inner casing means in said outer casing means for drawing air into an inlet end and discharging an initially annular converging stream of air from a discharge end of said outer casing means; turbine nozzle means on said inner casing means and located on the longitudinal axis of said outer casing means proximate the discharge end thereof for spraying water into the centre of said stream of air at said discharge end of the outer casing means to create a diverging stream of air-carried water droplets downstream of the discharge end of said outer casing means; and nucleator means mounted in said outer casing means between said outer and inner casing means proximate the discharge end of the outer casing means for mixing a jet of air and water to form very fine droplets of water, defining nuclei to promote snow formation, and for spraying said nuclei into the stream of air carried water droplets at a location at or immediately downstream of said discharge end of said outer casing means, whereby, temperature permitting, the water droplets adhere to the nuclei to form snow while airborne.

4,711,396

ELECTRICALLY ACTUATABLE FUEL-INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

Jürgen Lange, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,483
Claims priority, application Fed. Rep. of Germany, May 13, 1985, 3517258
Int. Cl.[4] B05B *3/14, 15/00, 7/06*; H01L *41/18*
U.S. Cl. 239—102.2 **2 Claims**



1. An electrically actuatable fuel-injection throttle comprising:

a block;

a piezoelectric oscillator mounted within said block and being formed as a hollow cylindrical radial oscillator having a longitudinal axis;

a plurality of continuous fuel-receiving chambers arranged within a wall of said block and extending parallel to said longitudinal axis and concentric to said longitudinal axis;

an annular constant-volume chamber which is formed out of said block concentrically to said longitudinal axis, one end of said radial oscillator extending with said fuel receiving chamber into said annular chamber;

a high voltage generator operatively connected to said piezoelectric oscillator;

a constant volume chamber and a central passage bore for conduction of intake air; and

a shielding chamber which encloses said high-voltage generator being developed annularly and concentrically to said longitudinal axis and separated from said constant-volume chamber,

said annular shielding chamber adjoining said central passage bore.

4,711,397

ELECTROMAGNETIC FUEL INJECTOR HAVING CONTINUOUS FLOW PATH

John E. Lahiff, Farmington, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 11, 1982, Ser. No. 338,799
Int. Cl.[4] F02M *53/04*
U.S. Cl. 239—125 **6 Claims**

1. A fuel injector for use in a predetermined spatial orientation with an internal combustion engine, said injector comprising;

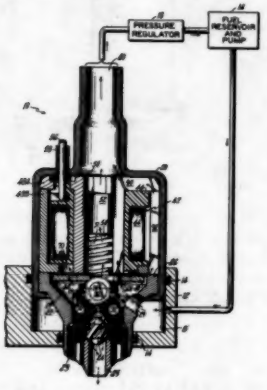
substantially tubular housing means having a fuel inlet opening, a fuel discharge opening and a fuel return opening, a continuous liquid path within said housing from said inlet opening to said return opening and a valved liquid path from said inlet opening to said discharge opening;

electromagnetic motor means supported within the housing means and including an armature, a coil, an electromagnetic frame and a tubular bobbin, said frame including at least a substantially vertically extending tubualr core portion and an upper flange extending radially outward therefrom, said coil being concentrically disposed about

said bobbin and said bobbin being concentric with the axis of said housing and coaxially disposed about said frame core portion below said upper flange, at least the upper flange of said electromagnetic frame including an opening extending upwardly therethrough, said continuous liquid path extending upwardly through the core of said bobbin via said electromagnetic frame tubular core portion and in parallel through said frame upper flange;

a valve seat operatively positioned in said valved path;

a valve member movable between a fuel-passing open position and a fuel-blocking closed position relative to said valve seat;



said armature being operatively connected to said valve member and responsive to energization of said electromagnetic motor means for moving said valve member between said closed and said open positions for controlling the flow of fuel to said discharge opening; and

the location of said fuel return opening being elevationally higher than substantially the entire remainder of said continuous liquid path and said valved liquid path when said injector is in said predetermined orientation with said engine thereby to facilitate the removal from the injector of vapors appearing therewithin and wherein the slope of said continuous liquid path is, for substantially its full length and in the direction of flow toward said return opening, 0 or positive relative to a horizontal axis or plane.

4,711,398

SPRAYING EQUIPMENT

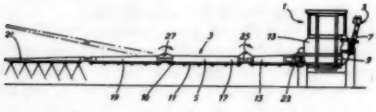
Alfred D. Ganderton, and William A. Brazier, both of Bromyard, England, assignors to E. Allman & Company Limited, West Sussex, England

Filed Feb. 11, 1986, Ser. No. 828,297

Claims priority, application United Kingdom, Feb. 12, 1985, 8503549; Mar. 4, 1985, 8505507

Int. Cl.[4] B05B *1/20*

U.S. Cl. 239—167 **21 Claims**



1. A boom for spraying equipment comprising a support structure adapted for mounting on a movable vehicle, first and second arms pivotally mounted on the support structure for movement between an operative position, in which the arms extend generally horizontally outwardly on respective opposite sides of the structure, and a stowed position, each arm comprising at least one boom section in which there is an elongate member extending lengthwise of the section, a plurality of spray nozzles fitted to an underside of the boom along the length thereof, and a spray line for connecting a tank on the said vehicle to the spray nozzles, each elongate member having an outer skin over a material which has a lower density than the skin, and the tensile and compressive strengths of the skin and the shear strength of the said material are sufficiently high for the boom to withstand tensile, compressive and shear forces to which it is subjected in use.

4,711,399

LIQUID SPRAYING DEVICES

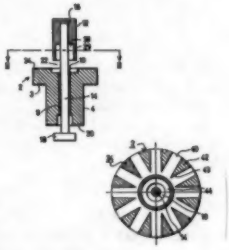
Peretz Rosenberg, Moshav Beit Shearim, Israel

Continuation of Ser. No. 613,337, May 23, 1984, abandoned. This application Aug. 13, 1986, Ser. No. 895,578

Claims priority, application Israel, Jun. 24, 1983, 69069; Jul. 1, 1983, 69144; Sep. 7, 1983, 69680

Int. Cl.[4] B05B *1/26*

U.S. Cl. 239—498 **6 Claims**



1. A nozzle connectible to a source of pressurized water and having a face formed with a bore defining an outlet orifice through which the water exits in the form of a jet perpendicularly to the nozzle face; a deflector member mounted close to and overlying said nozzle face and having a recess whose outer edge circumscribes the nozzle bore such that the deflector member is impinged by said jet and reflects same back towards said nozzle face;

said deflector member being mounted on a rod passing through the nozzle orifice and displaceable laterally and axially with respect to said outlet orifice so as to produce a lateral spray of water around the outlet orifice;

said nozzle face having said bore being formed with a plurality of channels extending generally radially of said nozzle to concentrate said lateral spray along said channels, said channels being defined by a plurality of triangular segments having apices spaced outwardly from said nozzle orifice and from the overlying outer edge of the recess of the deflector member so as to define an annular, flat, unchanneled surface underlying the recess of the deflector.

4,711,400

ELECTROMAGNETIC INJECTOR FOR AN I.C. ENGINE

Dario Radaelli, Legnano, and Walter Giraudi, Milan, both of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Feb. 5, 1986, Ser. No. 826,325

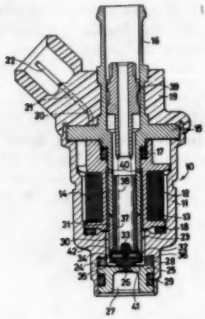
Claims priority, application Italy, Feb. 7, 1985, 19421 A/85

Int. Cl.[4] B05B *1/30*

U.S. Cl. 239—585 **8 Claims**

1. Electroinjector for an I.C. engine, said electroinjector comprising a core of ferromagnetic material, a coil surrounding the core, an injection nozzle, a small tubular movable armature positioned between the core and the injection nozzle and being coaxial with both said core and said injection nozzle, a return spring pushing the small armature towards said injec-

tion nozzle, a tube, partly inserted inside the core, acting as inner guide for the small armature, a duct for delivering the fuel towards the injection nozzle, an outer shell closing the magnetic circuit together with the core and the small armature, and there being a plate and a shutter, the electroinjector being characterized in that the small armature is provided with an



end wall constituted by said plate with said plate being formed of material resistant to deformation due to impact, and directly fastened on to the cylindrical side wall of the small armature independently of said shutter, and said shutter being made of sealing material and fixedly secured directly to said plate separate and apart from said armature.

4,711,401

METHOD OF GRINDING A HYDRAULIC CEMENT

Frank G. Serafin, Peabody, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 803,380, Dec. 2, 1985, Pat. No. 4,643,362. This application Jan. 16, 1987, Ser. No. 4,356

Int. Cl.[4] C04B *7/14*; B02C *23/00*

U.S. Cl. 241—16 **9 Claims**

1. A method comprising grinding a hydraulic cement, to reduce the particle size thereof, in the presence of an additive comprising a diester of an alkylene polyol, the amount of said additive present being sufficient to enhance the efficiency of the grinding operation.

4,711,402

APPARATUS FOR REDUCING THE SIZE OF AND/OR FOR MIXING SOLID, PASTY AND/OR LIQUID MATERIAL

Uwe Dräger, and Norbert Dräger, both of Krefeld, Fed. Rep. of Germany, assignors to DET-Drägcr-Energie-Technik GmbH & Co. KG, Wachtendonk, Fed. Rep. of Germany

Filed Jul. 30, 1986, Ser. No. 891,788

Int. Cl.[4] B02C *15/08*

U.S. Cl. 241—101.2 **11 Claims**

1. An apparatus for reducing the size of, and/or for mixing, solid, pasty and/or liquid material, said apparatus comprising:

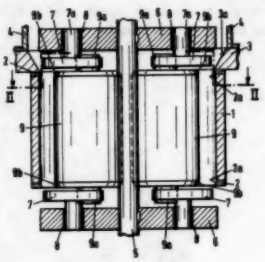
a cylindrical housing having an inner surface and a central axis;

at least one grinding roller, each of which cooperates with said inner surface of said housing; each grinding roller also has a central axis, with each grinding roller being rotatable about its central axis and eccentrically relative to said central axis of said housing; each grinding roller has two opposed end faces, each of which is provided with an axle end that is disposed on said central axis of that grinding roller;

two bearing disks, that are rotatably driven about said central axis of said housing, with each grinding roller being disposed between said bearing disks;

drive wheels respectively rotatably mounted on one of said bearing disks, with each of said axle ends being guided, with play, between two drive wheels in such a way that when said bearing disks rotate, said drive wheels rotatably drive said grinding rollers, which are pressed by centrifugal force against said inner surface of said housing; and

at least one guide ring provided on said housing for guiding each grinding roller in a direction parallel to its central



axis; each of said guide rings has at least one guide surface that extends at an angle to said central axis of said housing, and each guide roller is provided with correspondingly inclined contact surface means that cooperate with said guide surfaces to effect said axial guidance of said guide rollers.

4,711,403

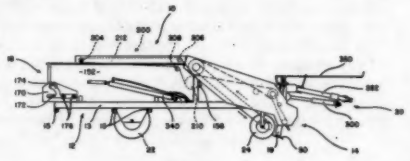
METHOD AND APPARATUS FOR CLEANING CHICKEN MANURE FROM CHICKEN HOUSES

Charles E. Gregory, Sr., 1304 Chauncey Dr., Tarboro, N.C. 27886; Bertram L. Jordan, Pierce St., Box 141, Lewiston, N.C. 27849, and Charles E. Gregory, Jr., 1304 Chauncey Dr., Tarboro, N.C. 27886

Filed Mar. 10, 1986, Ser. No. 838,156

Int. Cl.[4] B02C *21/02*

U.S. Cl. 241—101.2 **26 Claims**



1. An in-house chicken manure handling machine for cleaning and removing chicken manure and associated litter from the floor of a chicken house wherein the chicken manure and associated litter are often caked together and form a combined layer of manure and litter on the chicken house floor, said chicken manure handling machine comprising:

a. a mobile frame structure;

b. a pair of rear wheels mounted about a rear portion of said frame structure and a pair of front gage wheels mounted about the front of said frame structure;

c. chicken manure pick-up means mounted on front of said frame structure for scraping manure and associated litter from the floor of the chicken house, said chicken manure pick-up means including transverse blade means that extend across the front of said frame structure for engaging, scraping and lifting chicken manure and associated litter from the floor of the chicken house;

d. said front gage wheels including means for adjusting the height of said blade means relative to an underlying surface so as to adjust the depth that said blade means will penetrate the layer of chicken manure and associated litter being removed;

e. an elevator-shaker assembly mounted on said frame structure and disposed rearwardly of said blade means, said elevator-shaker assembly including an open-type elevator means for receiving the manure and associated litter picked up by said blade means and for conveying the chicken manure and associated litter upwardly and rearwardly therefrom toward an elevated discharge end of the conveyor means;

f. said elevator-shaker assembly including shaker means for shaking said elevating means and the manure and associated litter thereon as it is transferred toward the discharge end of said conveyor means and for separating litter from the manure in the process a the shaking conveyor means tends to break up and separate litter from the manure resulting in the litter falling through the open-type conveyor means onto the floor of the chicken house as the manure handling machine is moved through the house;

g. a movable load bed mounted to said same frame structure and disposed rearwardly of said elevator-shaker assembly for receiving manure and any other material discharged from the discharge end of said conveyor means;

h. means for movably mounting said load bed for both fore and aft movement on said frame structure;

i. load bed control means for moving said load bed fore and aftly on said frame structure between a loading position where a front end portion of said load bed underlies the discharge end of said conveyor means and a rearward dumping position; and

j. said control means including means for raising the front of said load bed relative to the rear of said load bed when said load bed assumes a dumping position on said frame structure such that material within said load bed can be discharged therefrom.

4,711,404

APPARATUS FOR CUTTING A PAPER WEB

Carl H. Falk, Karlstad, Sweden, assignor to Valmet-KMW Aktiebolag, Karlstad, Sweden

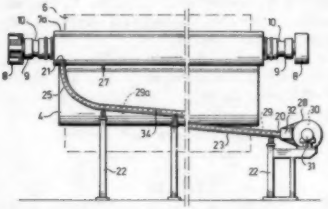
PCT No. PCT/SE86/00194, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/06357, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 29, 1986, Ser. No. 6,672

Claims priority, application Sweden, May 2, 1985, 85021186

Int. Cl.[4] B65H *19/26*

U.S. Cl. 242—56 R **11 Claims**



1. An apparatus for cutting a paper web, which is wound in a drum reel-up, by means of a transverse strip means or the like forming a free, wedge-shaped end of the moving paper web which is passed around a new reeling drum (*7a*) driven by a surface winding drum (**4**), characterized in that it comprises a conveying channel (**15**) having a longitudinal, relatively wide aperture (**19**) facing the surface winding drum (**4**), a first portion (**23**) of the conveying channel (**15**) being positioned below the paper web (**2**) and a second curved portion (**25**) of the conveying channel extending to the vicinity of a nip (**27**) defined by the surface winding drum (**4**) and the new reeling drum (*7a*) at a place beside the paper web (**2**), and that said conveying channel (**15**) is provided with means for producing gas jets (**44, 45**) arranged to actuate from both sides a length of strip means (*29a*) inserted into the conveying channel (**15**) in such a manner as to maintain it in position therein for conveyance to the nip (**27**).

4,711,405

METHOD AND APPARATUS FOR FIXING AN END OF A WEB ON A CORE TUBE IN A WEB REELING MACHINE

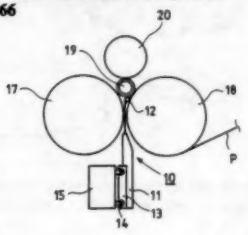
Heikki Niskanen, Järvenpää , Finland, assignor to Oy Wartsila AB, Finland

Filed Nov. 22, 1985, Ser. No. 800,977

Claims priority, application Finland, Nov. 27, 1984, 84 4653

Int. Cl.[4] B65H *18/20, 19/28*

U.S. Cl. 242—66 **8 Claims**



1. In a web reeling machine including a pair of spaced carrier rolls adapted to support a core tube around which the web is to be wound, a method for fixing an end of the web on the core tube, comprising the steps of:

supporting the core tube on the pair of spaced carrier rolls so that an underside of the core tube faces downwardly toward an inter-roll space defined between the spaced carrier rolls,

applying adhesive agent directly into contact with the underside of the core tube by means of direct contact of an adhesive agent applicator that extends from below the carrier rolls and that has an applicator head situated in the inter-roll space between the carrier rolls; and

fixing the end of the web to the core tube at a location thereon to which the adhesive agent has been applied.

4,711,406

COREHOLDER

Kenneth T. Barstow, 234 Axminister Dr., Fenton, Mo. 63026

Filed Jun. 2, 1986, Ser. No. 869,272

Int. Cl.[4] B65H *75/24;* **B23B** *31/40;* **B25G** *3/28*

U.S. Cl. 242—72 R **9 Claims**

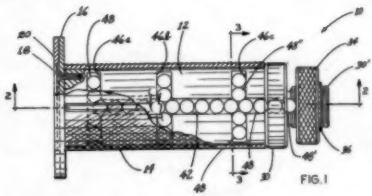


FIG. 1

1. Apparatus for securely holding for rotation a device having a circular central opening, comprising a coreholder body of generally cylindrical configuration, an expandable sleeve surrounding the coreholer body for receiving the device with the sleeve extending within the central opening of the device, the coreholder body defining grooves along its surface beneath the sleeve, a plurality of balls of uniform diameter extending along the lengths of the grooves in contiguous relationship, at least one of the grooves presenting an end one of the balls for pressure thereagainst, and means for selectively applying pressure against the presented ball to transfer pressure to others of the balls for causing the balls to apply pressure to the sleeve for producing outward expansion thereof for

uniformly and grippingly engaging interior surfaces of the device central opening.

4,711,407

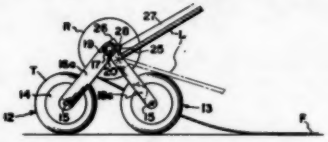
ROLL LIFTING, TRANSPORTING, AND UNROLLING DOLLY SYSTEM AND METHOD

Charles W. Boon, 515 33rd St., Fort Madison, Iowa 52627

Filed Feb. 5, 1987, Ser. No. 11,262

Int. Cl.[4] B65H *75/40*

U.S. Cl. 242—86.52 **16 Claims**



1. A roll lifting and transport assembly comprising:

a. laterally spaced apart wheeled assemblies, each comprising:

b. a set of front and rear ground-supported wheels;

c. a wheel support arm for each wheel, one of said arms of each set being formed with a journal, and the other being formed with a shaft received coaxially in said journal and mounting said arms for movement between spread loading position and a convergent, raised, transport position;

d. lever means swingably mounted to one of said arms in alignment vertically with one of said wheels for fulcrumming engagement with the periphery of said one of said wheels to raise the arms to transport position when the lever means is swung downwardly;

e. a demountable roll support means extending between said assemblies and supported by said arms; and

f. releasable latch means for disengageably securing the arms in transport position.

4,711,408

WEBBING WIND-UP FORCE LIMITING APPARATUS

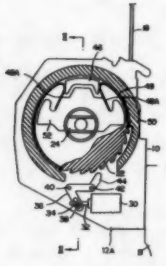
Shinji Mori, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Jan. 13, 1987, Ser. No. 2,976

Claims priority, application Japan, Jan. 14, 1986, 61-3439[U]

Int. Cl.[4] B60R *22/44*

U.S. Cl. 242—107 **18 Claims**



1. A webbing wind-up force limiting apparatus for use in a seatbelt system for a vehicle designed to restrain the body of an occupant in an emergency situation of the vehicle, comprising:

a pair of webbing take-up resilient members for biasing a take-up shaft for winding up an occupant restraining webbing in a direction in which said webbing is rewound;

a gear wheel interposed between said pair of webbing take-up resilient members;

a rotary member rotated together with said gear wheel and enlarged in diameter when said gear wheel rotates in the webbing rewinding direction;

an inertia member causing the diameter of said rotary member to be enlarged when said gear wheel rotates in the webbing rewinding direction; and

resistance applying means coming into contact with said rotary member when its diameter is enlarged to apply resistance to the rotation of said gear wheel.

4,711,409

PAWL CONTROLLED REEL EXTENSION

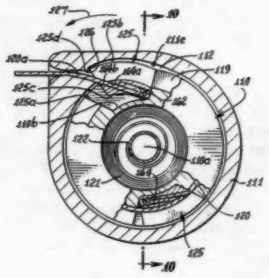
Ralph W. Jones, 1025 Avondale Rd., San Marino, Calif. 91108

Continuation-in-part of Ser. No. 766,537, Aug. 19, 1985, Pat. No. 4,638,959. This application Nov. 17, 1986, Ser. No. 931,522

The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.[4] B65H *75/48*

U.S. Cl. 242—107.4 R **21 Claims**



1. In line dispensing and retracting device, comprising:

(a) reel having a hub about which the line is wound as the reel rotates,

(b) structure mounting the reel for rotation relative thereto, and about an axis,

(c) a generally radially movable element carried by the reel to move between an inwardly retracted position in which the reel is free to rotate, and an outwardly extended position in which the movable element prevents further dispensing of the line,

(d) and the line wound on the reel in operative relation with the movable element to control said element's movement in response to reel rotation,

(e) said line including an inner winding extending sufficiently beneath said element as to urge the element outwardly relative to the reel in response to reel rotation in a line dispensing direction,

(f) and said line passing through said element.

4,711,410

REEL-DRIVING DEVICE FOR A VIDEOCASSETTE RECORDER

Seong T. Gwon, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 26, 1986, Ser. No. 878,603

Claims priority, application Rep. of Korea, Jun. 26, 1985, 7727/1985[U]

Int. Cl.[4] G03B *1/04, 1/40*; B65H *20/36*

U.S. Cl. 242—201 **2 Claims**

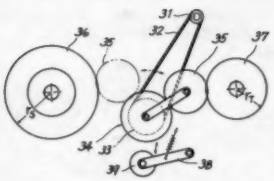
1. A reel-driving device for a videocassette recorder which comprises:

a supply reel for supplying a tape,

a take-up reel for taking up the tape, said take-up reel being provided with a diameter which is larger than a diameter of said supply reel,

a clutch disposed between said supply reel and said take-up reel for varying driving force transmitted from a pulley to meet an evenly required torque, and

an idler transmitting the evenly varied driving force alternatively to said supply reel or said take-up reel whereby the supply reel or take-up reel drives the tape to record, with



the revolution torque required in each of a CUE (forward search) and REVIEW (backward search) mode of the videocassette recorder.

4,711,411

AIRCREW HEADGEAR EJECTION MEANS

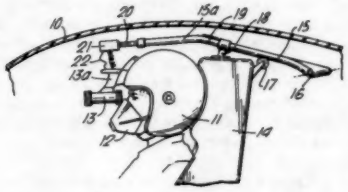
Warren K. Copp, Fleet, England, assignor to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 24, 1986, Ser. No. 922,881

Claims priority, application United Kingdom, Oct. 25, 1985, 8526386

Int. Cl.⁴ B64D *25/00*

U.S. Cl. 244—1 R **9 Claims**



1. Apparatus for ejection of aircrew helmet-mounted equipment from an aircraft cockpit, comprising an ejector arm engageable with an airman's ejection seat and having a first end pivotally mountable behind the seat, and a flexible linkage for attaching the helmet-mounted equipment to the second end of the ejector arm, so that in operation of the ejection seat, the arm is rotated about its pivot by upward movement of the ejection seat so that the equipment is detached from the airman's helmet and ejected from the cockpit by the rotating arm.

4,711,412

METHOD FOR HOMING ONTO A TARGET

Heinrich Wallermann, Lauf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

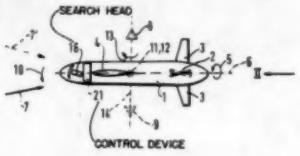
Filed Apr. 9, 1986, Ser. No. 850,716

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524925

Int. Cl.⁴ F41G *7/00*

U.S. Cl. 244—3.15 **4 Claims**

1. In a method for the homing onto a laterally forwardly detected target from a gliding flight trajectory of a projectile equipped with a search head, guidance surfaces and horizontal gliding surfaces, through the implementation of a roll motion for a yaw maneuver; the improvement comprising switching the guidance surfaces from a lift mode into a descent mode for transition from the gliding trajectory into a descending flight path incorporating said yaw maneuver wherein, at hard yaw maneuvers under large horizontal angles of displacement from the momentary direction of flight of the projectile, there is



reduced the roll motion which is to be superimposed on a pitch guidance for the projectile.

4,711,413

TARGET TRACKING ARRANGEMENT

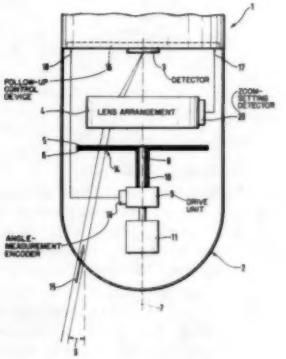
Lothar Stessen, Lauf, Fed. Rep. of Germany, assignor to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 939,539

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602456

Int. Cl.⁴ F41G *7/26*

U.S. Cl. 244—3.16 **8 Claims**



1. A target tracking arrangement located in a search head of a guided missile; comprising a detector; a lens arrangement, said detector being positioned behind said lens arrangement; two superimposed rotatable discs rotating at different rotational speeds being interposed in the optical path of said lens arrangement, said discs possessing different eccentrically extending radiation-penetratable slits.

4,711,414

PROJECTILE WITH INTEGRATED PROPULSION SYSTEM

Michael J. Dunn, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

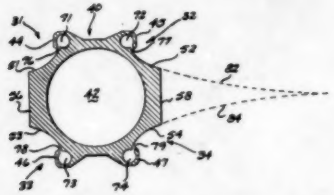
Filed Mar. 31, 1986, Ser. No. 846,023

Int. Cl.⁴ F42B *15/033*

U.S. Cl. 244—3.22 **13 Claims**

1. A projectile having an integrated propulsion system, the projectile comprising a body in which eight supersonic nozzles are positioned, the nozzles being arranged such that each nozzle can provide a reaction force having nonzero components along both a first axis and a second axis, the first and second axes being fixed with respect to the body and orthogonal to one another, the nozzles comprising first and second groups of four nozzles each, the first and second groups being spaced from one another along a third axis orthogonal to the

first and second axes, and the nozzles in each group being arranged such that for each direction along each of the first



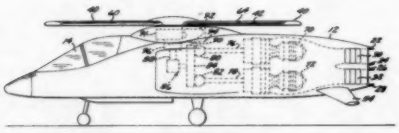
and second axes, two nozzles of the group can each produce a reaction force having a nonzero component along that direction.

4,711,415

X-WING HELICOPTER-SCOUT ATTACK CONFIGURATION

John A. Binden, Long Beach, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 30, 1985, Ser. No. 696,604
Int. Cl.[4] B64C *27/82*
U.S. Cl. 244—17.19 **10 Claims**



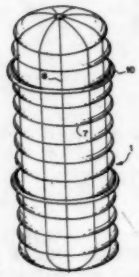
1. In an X-wing helicopter aircraft,
a fuselage defining a longitudinal axis of said aircraft,
a rotor assembly mounted on said fuselage for rotation at speeds below a predetermined value during helicopter phase operations and adpated to be stopped above said value to provide fixed X-wing airfoil,
supplemental fixed wings attached to the fuselage,
first, upper and second, lower jet engines mounted vertically one above the other and aligned vertically with respect to the longitudinal axis of the fuselage to provide symmetric and redundant flight control functions including yaw and pitch control, each of said engines providing a jet stream emanating therefrom rearwardly of said fuselage,
said fuselage having a tail section including upper and lower exhaust nozzles through which said jet streams pass in straight lines,
said nozzles each including means for controlling the direction of ejection of portions of the respective jet stream from said aircraft including
upper engine movable upper and lower vectoring flaps and upper engine movable, port and starboard vectoring cascades, said cascades being equally proximate said upper engine jet stream, and
lower engine movable upper and lower vectoring flaps and lower engine movable, port and starboard vectoring cascades, said lower engine cascades being equally proximate said lower engine jet stream,
movement of said vectoring flaps in unison serving as pitch control for said aircraft, movement of vectoring flaps to close the nozzle serving as a nozzle blocker to activate the vectoring cascades for yaw control, movement of said cascades to open either port or starboard serving as primary yaw control,
the movement of said vectoring flaps and cascades being equally functional in a lateral direction during helicopter phase maneuvers for either dual or engine-out operations.

4,711,416

STEERABLE LIGHTER THAN AIR BALLOON

Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales (C.N.E.S), Paris, France

Filed Dec. 5, 1985, Ser. No. 804,887
Claims priority, application France, Dec. 6, 1984, 84 18798
Int. Cl.[4] B64B *1/58*
U.S. Cl. 244—31 **12 Claims**



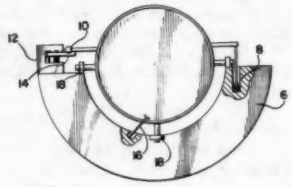
1. A steerable aerostatic balloon comprising a first outer envelope (1) containing air and having a generally cylindrical portion (1a) and upper (3) and lower (2) poles connected by an interpolar connector (11),
a grid of longitudinal reinforcements (8) extending longitudinally along said outer envelope and connected to said upper and lower poles,
a grid of circumferential reinforcements (7) extending transversely around said outer envelope so as to divide said outer envelope into a plurality of longitudinal lobes separated by said circumferential reinforcements, said outer envelope having peripheral folds between said circumferential reinforcements when said outer envelope is less than fully inflated for enabling the formation of said longitudinal lobes upon inflation of said outer envelope,
at least one inner evenlope (12) within said outer envelope and containing a lighter-than-air gas, said inner envelope resting against said outer envelope when inflated and having upper and lower poles attached to said interpolar connector, and
means for admitting air into said outer envelope and means for evacuating air from said outer envelope.

4,711,417

APPARATUS FOR EJECTION OF A SPACECRAFT

David A. Steffy, Hawthorne, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 26, 1985, Ser. No. 780,532
Int. Cl.[4] B64G *1/22*
U.S. Cl. 244—158 R **21 Claims**



1. In an apparatus for the ejection of a spacecraft from a launching vehicle having a support structure with a supporting cradle, means for restraining the spacecraft to the cradle, at least one pivot point support member and an ejecting mecha-

nism for imparting a force to one side of the spacecraft to provide a rotary movement about the pivot point support member during ejection, the improvement comprising:

a pivot support assembly including a pivot seat member movably connected to the cradle;

stop means for limiting movement of the seat member; and

means for biasing the seat member to a position adjacent the stop means at a predetermined force sufficient to prevent movement of the pivot seat member during ejection of the spacecraft.

4,711,418

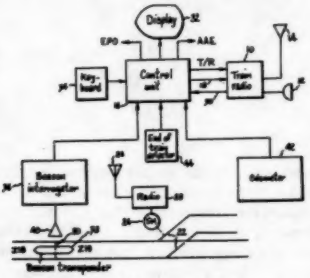
RADIO BASED RAILWAY SIGNALING AND TRAFFIC CONTROL SYSTEM

John H. Aver, Jr., Fairport, and William A. Petit, Spencerport, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Apr. 8, 1986, Ser. No. 849,614

Int. Cl.[4] B61L *3/02*

U.S. Cl. 246—5 **19 Claims**



1. A railway signaling and traffic control system in which the use of train stop apparatus can be avoided wherein first radio signals are transmitted from trains travelling along tracks and received at a central office and second radio signals are transmitted from the central office to the trains, said system comprising means for transmitting said first signals which represent the locations of each of said trains with respect to boundaries of successive zones along the tracks and identify the train which is transmitting said signals and the zones which the identified trains are entering and leaving, means responsive to said first signals for transmitting to identified trains said second signals which represent a signal aspect for the zone occupied by each of said identified trains and for the next zone, means on each train for displaying the aspect of the zone which it occupies and for storing the aspect for the next zone, means on each train for automatically operating said displaying means for displaying the stored aspect for the next zone ahead when the train enters the next zone, and means for automatically operating said displaying means for displaying in each train a signal aspect for said next zone more restricted than the signal aspect displayed by said displaying means in said train for the preceding occupied zone in the event that the signal aspect for said next zone is not being stored when said train enters said next zone.

4,711,419

BOOK OR SIMILAR ARTICLE HANGING DEVICE

Charles T. Polosky, 300 Hunters Glenn Ct., Atlanta, Ga. 30328

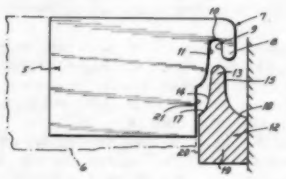
Filed Oct. 9, 1986, Ser. No. 917,038

Int. Cl.[4] E04G *5/06*

U.S. Cl. 248—225.2 **14 Claims**

1. An article hanging device for removably mounting an article on a vertical surface comprising

a tab-like sheet having means for securing at least one sheet side to said article, said sheet having a hook means integrally formed therein continuously along an edge thereof, said hook means comprising a protrusion for extending generally parallel to and spaced from said vertical surface, said protrusion having a substantially planar inside portion substantially parallel to said surface terminating into a rounded channel and a convex radius, said convex radius spaced apart opposite said protrusion inside portion to



form said hook means, said protrusion inside portion, said convex radius and rounded channel adapted to mate respectively with corresponding surfaces of an elongated rail mounted on said vertical surface and to guide the hook means onto the rail for positive locking of said hook means to said rail so that said article may be mounted by cantilevering said hook means on said rail.

4,711,420

BRACKET AND POST ASSEMBLY

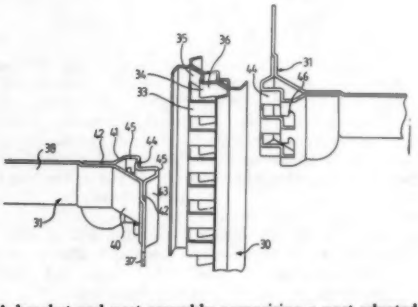
David J. W. Cowler, London, England, and Peter R. Lewis, 5 Station Road, Berkhamsted, Hertfordshire, England, assignors to Kenneth B. Fether; Richard Miles; Anthony Rostron and Peter R. Lewis, all of Hertfordshire, England

Filed May 8, 1985, Ser. No. 731,876

Claims priority, application United Kingdom, May 10, 1984, 8411943

Int. Cl.[4] A47B *57/20*

U.S. Cl. 248—243 **9 Claims**



1. A bracket and post assembly comprising a post adapted for use in an upright disposition, and a bracket detechably securable to the post,

the post and bracket including complementary engagement means, comprising, on the post, longitudinally successive support portions having alternate support portions constituting outer support portions, and a wall outward of the axis of the post and having a rear contacting surface extending between two positions on the post and other alternate support portions, constituting inner support portions, each comprising an angled wall extending between two positions on the post;

the complementary engagment means further comprising, on the bracket, a pair of angled walls diverging from a root portion of the bracket, each of the angled walls having an engagement slot, the two engagement slots joining at the root portion of the bracket to enable the slots to

receive one of the outer support portions of the post, the angled walls of the bracket having a lower edge surface and the wall of the outer support portion of the post having an upper edge surface, said lower edge surface and said upper edge surface being relatively contoured such that upon full introduction of the outer support portion into said engagement slot, the bracket drops through a portion of its height so that its angled walls rest on the upper edge surface of the wall of the outer support portion,

the bracket further including at its root, at least below said slots, an angled or curved engagement wall adapted to mate with an outward-facing mounting surface of the complementary shaped inner support portion of the post, to provide a rear buttress,

and said slots having at least two surfaces contacting a rear surface of the received outer support portion, said contacting surfaces being disposed so as to be subject to generally, relatively, orthogonal support forces through this contact.

4,711,421

SUPPORT FOR EXTERNAL REARVIEW VEHICULAR MIRROR

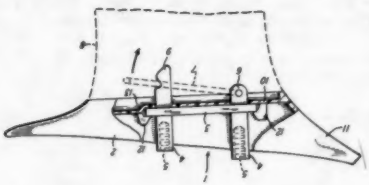
Bernhard Mittelhäuser, Am Krähenberg, D-3002 Wedemark 2, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,720

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1985, 8530609

Int. Cl.[4] G02B 5/08

U.S. Cl. 248—479 **3 Claims**



1. A support for an external rearview mirror for a motor vehicle, whereby said support serves for fastening of said mirror to said vehicle, and whereby a mirror housing, in which is disposed a mirror body, is pivotably connected to said support, via bracket means, in such a way that said mirror housing can tilt in the longitudinal direction of said vehicle; said support is also provided with a releasable arresting mechanism for holding said mirror body or mirror housing in its effective position; said support comprises:

a one-piece metallic member formed of a metal plate and, connected to the latter, said arresting mechanism, a pivot connection part for said bracket means, and means for fastening said support to said vehicle; and

a molded plastic member that substantially surrounds said metallic member and determines the external appearance of said support, with said molded plastic member being provided with catch means for connecting said metallic member with said molded plastic member.

4,711,422

GOLF CART UMBRELLA MOUNT BRACKET

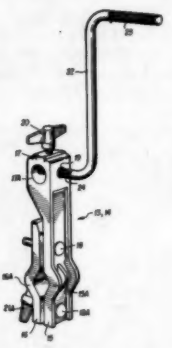
Rene L. Ibanez, 3520 Jermantown Rd., Fairfax, Va. 22030

Filed Aug. 29, 1986, Ser. No. 901,637

Int. Cl.[4] F16B 2/06

U.S. Cl. 248—515 **2 Claims**

1. For use with a vehicle having a rounded frame part to which an umbrella may be adjustably secured, a first and a second pair of clamping elements for attaching the handle of an umbrella to the vehicle, each of said clamping elements having a pair of lockable clamp jaws at one end with complementary dished portions and bolt means on both sides of said portions for grasping one of said umbrella and vehicle frame part and a block having two bores at right angles to each other at the other end of one of said separable clamp jaws of each clamping elements, locking screws threadedly received through said block and positioned to pass through said bores, a spacer rod having positioning arms extending off each end of said spacer rod in opposite directions at an angle directed away from the axis of said spacer rod, each positioning arm being receivable through the bore in the block of each of said first and second



pair of clamping elements remote from said clamp jaws, said spacer rod positioning arms being cylindrical in cross-section to pass through the bore in the end of said clamping elements remote from said clamp jaws and one wall of said bore threadedly receiving a locking bolt to lock said positioning arms in place relative to their attaching clamps, said positioning arms passing through the bore in said blocks to be engaged by and locked with the locking screw passing through each said block to permit universal positioning of the umbrella relative to the point of attachment to said vehicle.

4,711,423

SHOCK AND VIBRATION MOUNT

Jakhin B. Popper, Kiryat Haim, Israel, assignor to Popper Technologies (1983) Ltd., Kiryat Haim, Israel

Filed Apr. 17, 1986, Ser. No. 853,180

Claims priority, application Israel, Apr. 21, 1985, 74976

Int. Cl.[4] F16F 7/00

U.S. Cl. 248—635 **20 Claims**

1. A shock and vibration mount for mounting a supported device to a supported device, comprising:

a first rigid end member to be mounted to one of said devices;

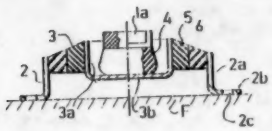
a second rigid end member to be mounted to the other of said devices;

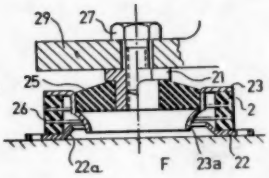
an intermediate rigid end member between said first and second rigid members;

a first elastic member fixed between said intermediate rigid member and one of said end rigid members such as to be strained only in compression under loads along a first orthogonal axis, and to be strained only in shear under loads along a second orthogonal axis;

and a second elastic member fixed between said intermediate rigid member and the other of said end rigid members and disposed in series with said first elastic member such as to be strained only in shear under loads along said first orthogonal axis, and to be strained only in compression under loads along said second orthogonal axis;

both said elastic members having a low shear modulus as compared to their compression modulus so as to exhibit





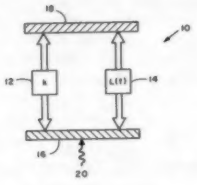
relatively low deflection under compression and relatively high deflection under shear.

4,711,424

COMBINATION ENERGY ABSORBING FOUNDATION

Vernon H. Neubert, Centre Hall, Pa., and Nicholas Perrone, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,871
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—636 **6 Claims**



1. An energy absorbing foundation positioned between rigid support and a foundation member that uniformly absorbs mechanical energy over as broadband of mechanical energy frequencies and a wide latitude of mechanical energy amplitudes, comprising:

first linear means including a linear spring positioned between said rigid support and said foundation member for elastically deforming in response to mechanical energy; and

second non-linear means including a plurality of side-loaded rings, coupled to said first linear means, for plastically deforming in response to mechanical energy;

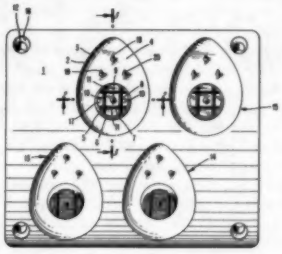
wherein said first means serves to attenuate small scale vibrations and said second means serves to attenuate large scale vibrations.

4,711,425

ROTARY MOLDING SYSTEM

Albert Spiel, Yonkers, N.Y.; James Roe, Wayne, and Henry C. Spanier, West Milford, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 578,040, Feb. 8, 1984, Pat. No. 4,634,597.
This application Aug. 20, 1986, Ser. No. 898,187
Int. Cl.⁴ B29C *33/42*
U.S. Cl. 249—117 **5 Claims**



1. A mold for use in a rotary molder, comprising:

a curved plate adapted for attachment to, and use in, a rotary molder;

said curved plate having at least one depression formed therein, on one side of said curved plate;

each of said at least one depression being bounded along said curved plate by a perimeter;

said perimeter being in the shape of an outline of an egg;

each said depression having a generally planar surface located entirely within said depression, the planar surface having a generally circular perimeter and being raised above the surrounding area of said depression;

said planar surface having a plurality of raised ridges thereon, each of said ridges lying entirely within said at least one depression;

said raised ridges being adapted to form grooves in dough which is received in said at least one depression;

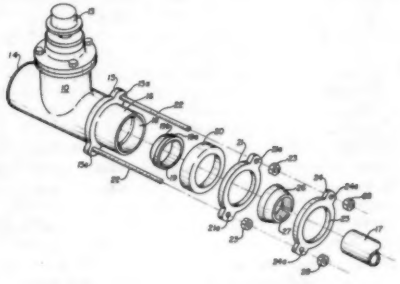
whereby dough passing beneath a rotary molder having said curved plate attached thereto is received by said at least one depression so as to be shaped thereby in the shape of an outline of an egg having a depression formed in the dough at a location corresponding to the location of a yolk in an egg.

4,711,426

FLANGED VALVE CONNECTORS

Thomas R. Bodnar, 3378 MacIntyre Dr., Murrysville, Pa. 15668

Continuation-in-part of Ser. No. 734,782, May 16, 1985, abandoned. This application Oct. 22, 1986, Ser. No. 922,007
Int. Cl.⁴ F16K *51/00*
U.S. Cl. 251—151 **4 Claims**



1. In combination with a valve including a valve body hav-

ing a longitudinal passageway therethrough, a closure element for said valve body intermediate its ends, operator means acting on said closure element to open and close the longitudinal passageway, a flanged valve connector comprising:

radial flange means on said valve body on at least one of the longitudinal ends thereof for securing a bolt on compression coupling assembly to said valve body;

an enlarged tubular member secured to said radial flange means and extending outwardly from said radial flange means and coaxial with said longitudinal passageway for receiving the end of pipe to be connected with said valve body;

said tubular member having a generally frusto conical end opening outwardly and sized to snugly receive a sealing gasket in sealed relationship between said tubular member and a pipe to be connected with said valve body; and

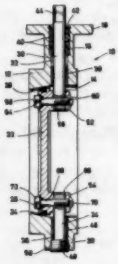
said tubular member having an axial length sufficient to be engaged by a gasket retainer having a cylindrical section sized to surround said sealing gasket and the end periphery of said tubular member and a radial section for snugly engaging said sealing gasket arranged in union with said frusto conical end opening and to receive a follower ring having a deep longitudinal flange extending over the periperal length of said tubular member and engaging said gasket retainer, the follower ring functioning to secure the gasket retainer and gasket to said tubular member.

4,711,427

APPARATUS FOR CONNECTING A VALVE ELEMENT TO A VALVE STEM

Edward G. Holtgraver, Spring, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Aug. 20, 1986, Ser. No. 898,433
Int. Cl.[4] F16K *1/22*; B21D *53/00*
U.S. Cl. 251—308 **7 Claims**



1. In a rotary valve having a valve body a valve element, a valve stem, and a first bore in said valve element for receiving said valve stem for rotatably mounting said valve element in said valve body, the improvement comprising:

a second bore transverse to and intersecting said first bore, said second bore having a first portion on one side of said first bore and a second portion on the diametrically opposite side of said first bore;

said valve stem having a hole therethrough, said hole being in register with said second bore in said valve element, the portion of said hole adjacent said second portion of said second bore being threaded;

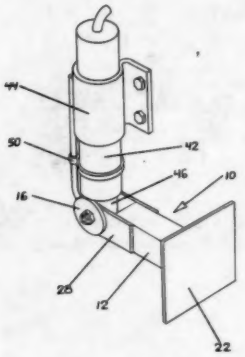
a retaining member received in said second bore and extending through said hole, said retaining member having a threaded shank portion, said threaded shank portin being threadedly received in said threaded portion of said hole in said valve stem, at least one of the threads of said shank portion being received in said second portion of said second bore, said second portion of said second bore being dimensioned such that said at least one thread of said threaded portion of said shank portion frictionally engages the wall of said second portion of said second bore, said second portion of said second bore being positioned such that said threaded shank portion and said threaded hole are engaged before said at least one of the threads of said threaded shank portion is received in said second portion of said second bore.

4,711,428

HYDRAULIC LEVELING DEVICE

Willis M. Carpenter, Albuquerque, N. Mex., assignor to Hydra-Level, Inc., Phoenix, Ariz.

Filed Sep. 24, 1986, Ser. No. 911,492
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—423 **15 Claims**



1. An apparatus for pivoting a leg relative to a hydraulic cylinder comprising:

a leg having a longitudinal axis;

means for pivotally attaching one end of said leg to one end of a hydraulic cylinder having a longitudinal axis, when provided, said means allowing said leg to pivot between an extended position substantially longitudinally aligned with the hydraulic cylinder and a storage position,

a wheel; and

attachment means for disposing said wheel on said leg near its one end at a position offset from the longitudinal axis of said leg, said wheel providing a circumferential bearing surface for contacting a selected part of the hydraulic cylinder during cylinder contraction and extension, thereby causing said leg to pivot relative to the hydraulic cylinder between said extended position and said storage position.

4,711,429

TUNDISH FOR MIXING ALLOYING ELEMENTS WITH MOLTEN METAL

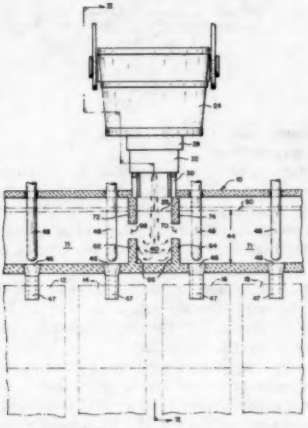
David J. Diederich, and John C. Paddock, both of Lorain, Ohio, assignors to USX Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1986, Ser. No. 901,843
Int. Cl.[4] B22D *41/08*
U.S. Cl. 266—44 **3 Claims**

1. A process for mixing at least one alloying element with molten metal in a tundish, said alloying element having a density greater than that of said molten metal, said process including pouring molten metal from a ladle into a tundish having outer walls defining a cavity for containing a predetermined volume of said molten metal therein at a specified depth, said tundish being adapted to receive the steam of molten metal from said ladle at an entry station having a vertical axis displaced horizontally from the vertical axis of a first outlet opening of the tundish, adding said alloying element to the molten metal and draining the molten metal from the tundish through said first outlet opening into a casting mold,

the improvement in said process for uniformly mixing said alloying element with the molten metal in said tundish which comprises:

pouring molten metal from said ladle into a tundish having a mixing zone directly below said receiving station, said mixing zone including a generally vertical first inner wall extending upwardly from a bottom surface of the tundish cavity to a height which is at least forty percent of the specified depth of molten metal in said tundish, said first inner wall extending transversely to the direction of flow of molten metal from said entry station to said first outlet opening, said first inner wall defining at least a portion of the lower periphery of at least one opening for flow of molten metal from said entry station to said first outlet opening, the lower periphery of each opening in the inner wall being at a height not less than forty percent of the specified depth of molten metal in said tundish, the aggregate cross sectional area of said openings in the first inner wall being not less than the cross sectional area of the first outlet opening, said first inner wall being spaced from the vertical axis of said entry station a distance within the range of 20 to 65 cm in a direction normal to said first inner wall, said mixing zone including another wall essentially parallel to said first inner wall and located substantially the same distance from the vertical axis of said entry station as said first inner wall in a direction normal thereto and remote therefrom, said mixing zone including a pair of spaced generally vertical walls joining said first inner wall and said other wall at opposed ends thereof, injecting said alloying element into the stream of molten metal being poured from the ladle into said tundish, and mixing said alloying element with the molten metal in said mixing zone using the force of said stream from the laddle to create sufficient turbulence to obtain uniform distribution of said alloying element in the metal.



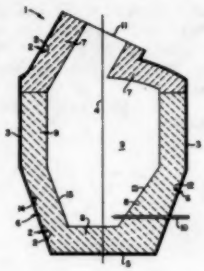
4,711,430

SIDE-INJECTED METAL REFINING VESSEL AND METHOD

Jonathan J. Feinstein, North Salem, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 1, 1986, Ser. No. 846,801
Int. Cl.[4] C21C *5/44, 5/48*
U.S. Cl. 266—47 **18 Claims**

1. A metal refining vessel comprising a bottomwall, a sloped section having a lining of consumable refractory and contacting the bottomwall, and a tuyere passing through the lined sloped section proximate the bottomwall enabling side injection of gas into a metal melt during refining, the consumable refractory lining cold face having an axis angle less than that of the consumable refractory lining hot face for a distance, in a direction away from the bottomwall, from the tuyere to a point, such that the lining thickness at the tuyere is at least ten percent greater than the lining thickness at said point, whereby the thickness of the consumable refractory lining substantially constantly decreases throughout the distance from the tuyere to said point.

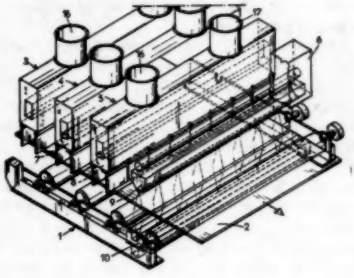


4,711,431

SPRAY-COOLING APPARATUS

Stéphane G. J. Viannay, Voisin-le-Bretonneux; Bernard M. Roth, Boulogne-Billancourt; Solange M. V. Mirigay, Chaville, and Georges J. B. Chastang, Coignieres, all of France, assignors to Bertin & Cie, Plaisir-Cedex, France

Filed Mar. 5, 1986, Ser. No. 836,481
Claims priority, application France, Mar. 6, 1985, 85 03281
Int. Cl.[4] C21D *1/667*
U.S. Cl. 266—114 **9 Claims**



1. Spray-cooling apparatus comprising, in succession, spray bar means and a plurality of suction chambers, said spray bar means being arranged between said suction chambers, said spray bar means and suction chambers each being arranged opposite the surface of a continuously horizontally moving hot sheet of material wherein free spaces are provided between said spray bar means and said chambers for intake of a secondary air flow, the distances between said spray bar means and a hot surface to be cooled and distances between two consecutive spray bar means being selected and defined so as to channel gas flow emitted by a sprayer and the secondary air flow towards the suction chamber and accompanying sprayer jets in such a way as to transport droplets which bounce off the hot surface.

4,711,432
GAS WASHING DEVICE

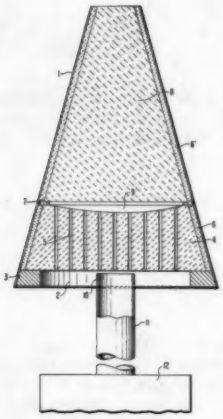
Michael Heinz, Saarbrücken; Joachim Lange, Hünstetten; Udo Muschner, Tönisvorst; Herbert Naefe; Hans Rothfuss, both of Wiesbaden; Manfred Winkelmann, and Hans-Joachim Winkler, both of Krefeld, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 23, 1986, Ser. No. 877,971

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523171

Int. Cl.[4] C21C *5/48*

U.S. Cl. 266—220 3 Claims



1. A gas washing device for supplying gas through a metallurgical vessel to molten metal therein, said device comprising:

a metal jacket to be positioned to extend through a wall of a metallurgical vessel;

an inner permeable gas sink positioned within said jacket and having an inner surface to contact molten metal within the metallurgical vessel;

an outer permeable gas sink positioned within said jacket at a position outwardly of said inner gas sink and to be spaced from the molten metal;

gas inlet means for supplying gas from a gas supply to said jacket such that said gas flows first through said outer gas sink and then through said inner gas sink into the molten metal;

sealing ring means positioned between said outer and inner gas sinks and sealing against said jacket for preventing leakage of said gas between said gas sinks;

gas distribution means formed between an inner end of said outer gas sink and an outer end of said inner gas sink for ensuring that gas immerging from said inner end of said outer gas sink is supplied uniformly over substantially the entire area of said oter end of said inner gas sink; and

means for detecting immediately consumption of said inner gas sink by the molten metal without interrupting the supply of gas thereto, said detecting means comprising said outer gas sink having a gas permeability greater than that of said inner gas sink such that upon consumption of said inner gas sink the flow of said gas wiil increase abruptly, and gas flow meter means connected to said gas supply at a position upstream of said gas inlet means for detecting said abrupt increase of gas flow.

4,711,433
COPPER CONVERTER

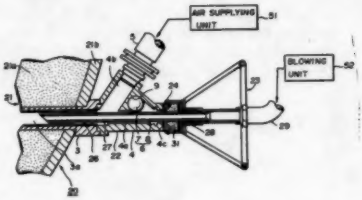
Motoo Goto, Nagareyama; Hiroshi Kono, Iwaki; Haruhiko Asao, Iwaki; Yukio Miyamoto, Iwaki, and Toshihiko Igarashi, Iwaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1986, Ser. No. 873,784

Claims priority, application Japan, Jun. 13, 1985, 60-128970; Jun. 13, 1985, 60-128971; Jun. 13, 1985, 60-128972

Int. Cl.[4] C21C *5/48*

U.S. Cl. 266—222 8 Claims



1. A copper converter comprising:

(a) a converter body;

(b) a plurality of tuyeres provided on the converter body, each tuyere having an outer end portion;

(c) a first concentrate blowing pipe assembly provided on at least one of said tuyeres, each said first concentrate blowing pipe assembly including an introducing pipe inserted into a respective one of said tuyeres;

(d) a blowing means, connected to each said first concentrate blowing pipe assembly, for blowing a material including a concentrate through a respective said introducing pipe into the converter;

(e) air supplying means, provided on said tuyeres, for supplying pressurized air to said tuyeres; and

(f) formations provided both on said outer end of each tuyere and on each said first concentrate blowing pipe assembly and adapted to detachably interengage;

each said first concentrate blowing pipe assembly comprising a radially outwardly projecting attachment member rigidly mounted around a one end portion of the respective said introducing pipe;

each said interengaging formation of each said first concentrate blowing pipe assembly being formed on the respective said attachment member;

each said interengaging formation provided on the outer end of each tuyere comprising a plurality of locking pins projecting radially outwards from the outer end of the respective said tuyere, said attachment member of each first concentrate blowing pipe assembly comprising a sleeve portion, rigidly mounted around the respective said introducing pipe, and a hollow cylindrical portion, having an inner diameter larger than the respective said sleeve portion and formed substantially concentrically and integrally with the respective said sleeve portion, and wherein said interengaging formation of each said attachment member comprises a plurality of slots formed in the respective said hollow cylindrical portion of the respective said attachment member, each said slot being adapted to detachably engage with a corresponding one of said locking pins.

4,711,434
SPRING DISC

Donald L. Haag, 1302 E. 18th St., Sterling, Ill. 61081

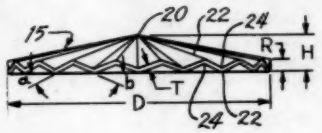
Filed Jul. 7, 1986, Ser. No. 882,410

Int. Cl.[4] F16F *1/02*

U.S. Cl. 267—161 2 Claims

1. A solid spring disc made of resiliently yieldable material and having first and second oppositely facing surfaces, said

disc having a generally circular periphery and being shaped as a shallow right circular cone, each surface of said disc being defined by a plurality of angularly spaced and flat and planar triangular segments of identical size and shape disposed in adjoining side-by-side relation, each of said triangular segments having a pair of side margins, having an apex located at the apex of said cone and having a base located opposite the



apex of the segment and extending along the periphery of said disc, and adjoining segments being inclined at equal oblique angles relative to a plane extending perpendicular to the axis of said cone and being inclined relative to said plane in such a direction that adjoining side margins of adjoining segments define a crest on one surface of said disc and define a valley on the opposite surface of said disc, said crests and valleys alternating with one another around each surface of said disc.

4,711,435

APPARATUS FOR HYDRAULIC DAMPING

John L. Harris, Kiln Cottage, Brighton Road, Lower Beeding, Horsham, West Sussex RH13 6NJ, England, and John F. Benyon, 6 Denning Close, Fleet, Aldershot, Hampshire GU 13 9SP, England

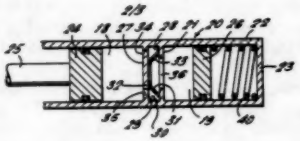
PCT No. PCT/GB84/00199, § 371 Date Feb. 7, 1985, § 102(e) Date Feb. 7, 1985, PCT Pub. No. WO85/00209, PCT Pub. Date Jan. 17, 1985

Continuation of Ser. No. 700,879, Feb. 7, 1985, abandoned. This PCT application Jun. 8, 1984, Ser. No. 891,411

Claims priority, application United Kingdom, Jun. 20, 1983, 8136722

Int. Cl.[4] F16F *9/34, 9/50*

U.S. Cl. 267—221 **4 Claims**



1. An apparatus for hydraulic damping comprising the combination of

a housing defining a first enclosure, a second enclosure and a chamber between said enclosures, said chamber having two surfaces facing each other, and means defining first and second ports for allowing fluid communication between said chamber and said first and second enclosures, respectively;

first piston means movable in said first enclosure in response to externally applied force for changing the effective volume of said first enclosure;

second piston means movable in said second enclosure, said housing and said first and second piston means defining an enclosed space between said piston means;

hydraulic fluid filling said space;

resilient energy storage means within said second enclosure for compression by said second piston means; and

bidirectional valve means comprising a valve member within said chamber, said valve member comprising

an elastic, truncated hollow cone having a small diameter end and a large diameter end,

each of said ends being closely adjacent one of said surfaces in the absence of a fluid pressure difference between said ports,

said valve member being responsive to a difference in fluid pressure between said ports in either direction to elastically deform and flatten to allow fluid flow through said ports between said enclosures in the direction of said difference and to be progressively increasingly flattened in response to increased flow rate in either direction of fluid flow so as to provide a decreasing spring rate in either direction, and wherein flow of fluid in the direction from said second port to said first port is substantially through said conical valve member and flow of fluid in the opposite direction is substantially across the outer surface of said valve member.

4,711,436

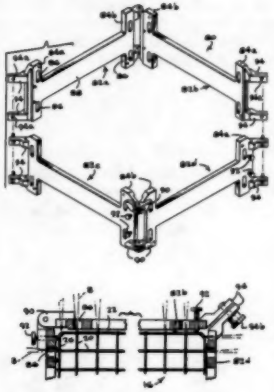
GRID ASSEMBLY FIXTURE, RETENTION STRAP AND METHOD

Richard M. Kobuck, Delmont, and Ralph W. Kalkbrenner, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 414,198, Sep. 1, 1982, Pat. No. 4,519,593. This application Feb. 19, 1985, Ser. No. 703,231

Int. Cl.[4] G21C *21/00*; B25B *1/20*

U.S. Cl. 269—40 **4 Claims**



1. A retention strap for holding in assembled relationship before welding a grid assembly comprising mating, perpendicular inner straps, and outer straps extending about said inner straps, comprising four bars, each of generally "H" shape, and including a pair of end posts connected together by a cross member, each post having openings therethrough located above and below the connecting cross member, means for hingedly connecting first and second said bars and means for hingedly connecting third and fourth said bars to provide pairs of hinged bars, and means for releasably connecting two said pairs of bars.

4,711,437

WORKPIECE SECURING APPARATUS FOR A MACHINE TOOL

Francis S. Longenecker; Kevin J. Moeder, both of Englewood, and Jeffrey L. Wolff, Dayton, all of Ohio, assignors to TE-Co., Englewood, Ohio

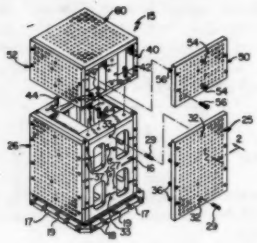
Filed Sep. 2, 1986, Ser. No. 902,574

Int. Cl.[4] B23Q *3/06*

U.S. Cl. 269—91 **21 Claims**

1. Apparatus for securing a workpiece to a table of a machine tool, comprising a base plate including means defining an array of perpendicular rows of threaded holes and precision

bores having parallel axes and forming an X-Y grid pattern, an angularly adjustable plate including means defining an array of perpendicular rows of threaded holes and precision bores having parallel axes and forming an X-Y grid pattern, said adjustable plate also having means defining a plurality of precision angular positioning bores for selectively positioning said adjustable plate at a series of predetermined acute angles relative to said base plate, a pair of said angular positioning bores



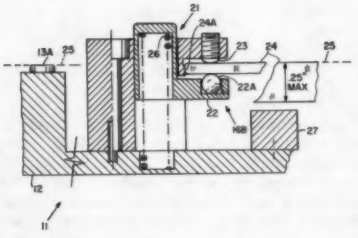
for each predetermined angular position of said adjustable plate, each said pair of angular positioning bores in said adjustable plate being located in precise axial alignment with a corresponding pair of said precision bores forming said X-Y grid pattern of bores within said base plate when said adjustable plate is disposed at each of said predetermined angles, a pair of locating pins extending within each said pair of axially aligned bores, and means for clamping said adjustable plate to said base plate.

4,711,438

MASK HOLDING

Nicholas Guarino, Arlington, Mass., assignor to Micrion Limited Partnership, Beverly, Mass.

Filed May 8, 1986, Ser. No. 861,132
Int. Cl.[4] B25B 1/00
U.S. Cl. 269—152 **2 Claims**



1. A holder for a mask or substrate to be processed by a particle beam comprising,

a plate holder having a base and an upstanding perimetrical wall to define a recess for accommodating masks or substrates to be processed,

said wall having three spaced studs each having a top surface in a common plane parallel to said base with at least one of said studs separated from at least one other of said studs by said recess,

means defining at least one set of three clamping points on said base with at least one of said three clamping points separated from at least one other of said three clamping points by a region in said recess for accommodating a mask or substrate to be processed,

and clamping means at each of said clamping points for clamping the edges of a mask or substrate to be processed,

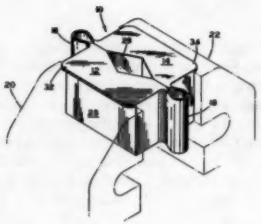
said clamping means having means for selectively adjusting the position of the mask or substrate to be processed so that the surface thereof away from said base coincides with said common plane.

4,711,439

VICE JAW SUPPORT APPARATUS

Edward N. Campbell, Oklahoma City, Okla., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 29, 1986, Ser. No. 913,177
Int. Cl.[4] B25B 1/24
U.S. Cl. 269—277 **7 Claims**



1. An apparatus for supporting a workpiece within a pair of vice jaws, said apparatus comprising a pair of jaw inserts, each insert comprising means for support on one jaw of said pair of vice jaws, each insert being formed of a resilient material and having coacting mating surfaces disposed for holding said workpiece, said inserts integrally joined together by means providing non-pivotal linear movement of each insert relative to the other, wherein said apparatus comprises a unitary molded construction, wherein said means of joinder of said inserts together comprises a pair of flexible webs formed as integral parts of said apparatus, said webs being integrally formed with said resilient unitary apparatus, said webs being positioned symmetrically on opposing sides of said mating surfaces, each of said webs attached integrally to one edge of one of said surfaces, each web being disposed to deform outwardly of said inserts when said inserts are moved toward one another.

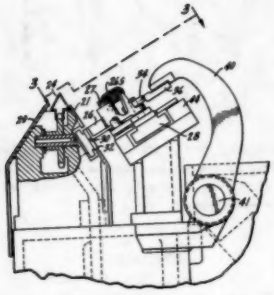
5. An apparatus for supporting a workpiece within a pair of vice jaws, said apparatus comprising a pair of jaw inserts, each being supported on one jaw of said pair of vice jaws, each insert comprising a resilient body of material having coacting mating surfaces thereon, wherein a first of the pair of inserts defines a pair of first bores therethrough, the second insert defining a pair of second bores therethrough, each one of said second bores in alignment with one of said first bores, and means slidably disposed within each set of aligned first and second bores for interconnecting said first and second inserts and providing non-pivotal, linear movement of said first and second inserts to and from one another, wherein each insert comprises a molded polyethylene, and wherein said means providing a non-pivotal, linear movement of said inserts relative to the other comprises a pair of elongated floating pins interconnecting said inserts, each pin having a head at each end, said sets of first and second bores each defining a set of coaxially positioned exterior and interior bore portions, said interior bore portions disposed for slidably piloting said floating pins, said exterior bore portions of said sets of first and second bores disposed for containment of said pin heads, wherein each interior bore portion has a smaller diameter than its associated coaxial exterior bore portion, and wherein said heads will not protrude from said exterior bores when said coacting mating surfaces of said jaw inserts are in contact with one another.

4,711,440

SIGNATURE MACHINE WITH COUNTERPULSE WEIGHT SHUTTLE BAR DRIVE

Raymond I. Bulka, Oak Lawn, and David J. Nowaczyk, Chicago, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Nov. 17, 1986, Ser. No. 931,054
Int. Cl.[4] B42B 1/02
U.S. Cl. 270—53 16 Claims



1. In a cyclically operable signature machine having a conveyor in which signatures are collected one atop another as they are fed from hoppers to the conveyor which moves the collected signatures, constituting an unbound book, to a binder station where the signatures are joined at their backs to afford a bound book:

a set of grippers and support therefor at the stitching station, supported and guided for horizontal reciprocal shuttle action to feed the books through the stitching station;

a reciprocal drive bar connected at one end to the gripper support for producing a 360° cycle of horizontal shuttle action including a 180° forward feed stroke from starting position and a 180° nonfeed return stroke back to starting position;

a sun gear and a planetary gear coupled thereto and supported for repeated 360° revolutions relative to the sun gear;

said planetary gear being rotatable about its own axis while revolving relative to the sun gear and having a radius arm secured thereto for rotation therewith, and a counterpulse weight on a weight support extending radially outward of the axis of rotation of the planetary gear to rotate therewith;

the free end of said arm being pivotally joined to the opposite end of the drive bar so that as the planetary gear circumnavigates the sun gear through 360° the drive bar is reciprocated to reciprocate the gripper support and its mass harmonically with maximum velocity substantially at the midposition of each stroke;

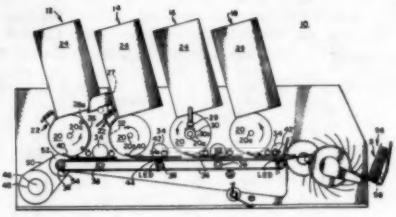
and said counterpulse weight being so positioned radially that its harmonic displacement from midposition, taken as the axis of the sun gear, is approaching minimum when the displacement of the gripper bar mass from midposition is approaching maximum.

4,711,441

ELECTRONIC CONTROLLER FOR DISPENSERS AND THE LIKE

Lawrence D. Taylor, Lansdale, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Division of Ser. No. 699,055, Feb. 7, 1985. This application Mar. 27, 1986, Ser. No. 844,977
Int. Cl.[4] B65H 3/06, 7/14
U.S. Cl. 271—6 3 Claims



1. Apparatus for dispensing sheets arranged in stacks provided in a plurality of dispensing devices;

a common sheet delivery means;

each of said dispensing devices including a feed roller for advancing one sheet from its associated stack to said sheet delivery means;

an output location for receiving sheets delivered thereto by the sheet delivery means;

a sensing device for each dispensing device located near a point along the sheet delivery means at which a sheet is delivered to the sheet delivery means by the associated dispensing device;

motor means for each feed roller;

a home position sensor for each feed roller to indicate the home position of its associated feed roller;

microprocessor means comprising means for a selected dispensing device for selectively driving the feed roller motor means thereof through one revolution to feed a sheet to said sheet delivery means;

means for examining the sensing device associated with the selectively driven feed roller motor means to determine if a sheet has been dispensed during a latter portion of said revolution;

a means for driving the selectively driven feed roller motor means through a subsequent revolution if the associated sensing device fails to indicate the feeding of a sheet to the sheet delivery means;

and means for examining the home position sensor associated with the selectively driven feed roller motor means during a latter portion of the revolution of the feed roller to determine if the feed roller has returned to the home position.

4,711,442

SHEET SUPPLY APPARATUS FOR TYPEWRITERS, HAVING SLEWING ROLLERS ENGAGING A PLATEN ROLL, AND METHOD

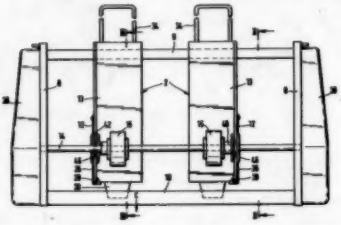
Kurt Rünzi, Küsnachterstrasse 59, CH-8126 Zumikon, Switzerland

Continuation of Ser. No. 768,199, Aug. 22, 1985, abandoned, which is a continuation of Ser. No. 536,862, Sep. 29, 1983, Pat. No. 4,558,858. This application Mar. 20, 1987, Ser. No. 29,349
Claims priority, application Switzerland, Oct. 12, 1982, 5957/82
Int. Cl.[4] B65H 3/22
U.S. Cl. 271—22 21 Claims

1. Single-sheet feed apparatus for office-type automatic writing machines, having

a frame (8,10) including spaced side elements (8),

a rotatable shaft (14) and at least two feed rollers (15) rotatable with said shaft,
and comprising
an assembly including
two parallel rockers (2,12) each having a respective support surface (13);
movable means (9) for commonly engaging the rockers (2,12) extending between the side elements (8) and securing the rockers for common movement upon motion of the movable means, said rockers being shiftably secured to the movable means to permit shifting movement of the rockers between the side elements (8) of the frame;
an abutment element (18) located adjacent the end of each rocker at the leading or feeding edge of the sheet;



sheet separating elements (28) located adjacent the corners of the leading edges of the sheets and pivotably secured to, and axially movable with, the rockers,
wherein each rocker (2,12) contains a spring (40) urging said respective support surface (13) against a respective one of said feed rollers (15);
the rotatable shaft (14) extends transversely of the apparatus between the spaced side elements (8); and
engagement elements (46,48) are provided, coupled to move with the support surfaces of the respective rockers (2,12) and further coupled to move with the respective feed rollers (15) for moving said feed rollers axially along rotatable shaft (14) conjointly with shifting of the respective rockers between said spaced side elements (8).

4,711,443

SHEET SUPPLY DEVICE

Tsutomu Fujiwara; Susumu Matsuda; Keisuke Murakami; Izumi Ogawa; Mamoru Tago; Chihiro Aoki; Masahiro Doi, and Hiroshi Anno, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

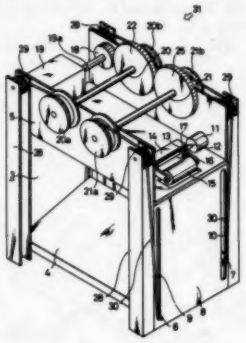
Filed Nov. 7, 1986, Ser. No. 927,953

Claims priority, application Japan, Nov. 7, 1985, 60-249754; Oct. 3, 1986, 61-152347[U]

Int. Cl.[4] B65H *1/08*

U.S. Cl. 271—126 **11 Claims**

1. A sheet supply device, comprising:
a sheet stocker including a lifting table for receiving a large number of sheets accumulated in layers thereon, the sheets being different in thickness between opposite sides thereof, said sheet stocker further including a paper feed roller for contacting with an uppermost one of the sheets on said lifting table;
one or more string members having one end or ends fastened to each of opposite sides of said lifting table corresponding to the opposite sides of the sheets providing the difference in thickness;
a first take-up drum or drums located corresponding to the thicker side of the sheets and having the other end or ends of those of said string member or members corresponding to the thicker side of the sheets fastened thereto;
a second take-up drum or drums located corresponding to the thinner side of the sheets fastened thereto; and
a lifting inclining means for causing said first take-up drum



or drums to take up the string member or members at a higher taking up speed than the taking up speed at which said second take-up drum or drums take up the string member or members.

4,711,444

SHEET SORTING DEVICE

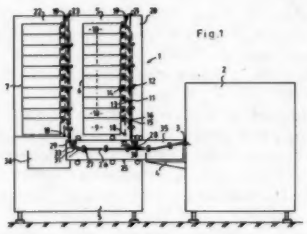
Petrus A. M. Geurts, Helden, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Mar. 27, 1986, Ser. No. 844,883

Claims priority, application Netherlands, Mar. 29, 1985, 8500929

Int. Cl.[4] B65H *39/10*

U.S. Cl. 271—290 **8 Claims**



1. A sheet sorting device for use in a sheet processing machine comprising at least one sorting unit having a plurality of superposed sheet receiving bins and a first conveyor means for conveying sheets selectively to one of said sheet receiving bins and a second conveyor means positioned below and substantially normal to said first conveyor for conveying sheets from said processing machine to said first conveyor, said second conveyor means being moveably mounted to said sorting unit so as to be displaceable between a first position disposed below said receiving bins and a second position adjoining said sheet processing machine.

4,711,445

THERAPEUTIC HAND EXERCISER

Edward J. Whitehead, Lititz, Pa., assignor to Duro Med Industries, Inc., Hackensack, N.J.

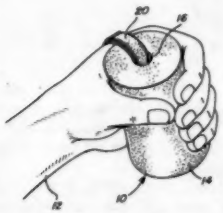
Filed Sep. 3, 1981, Ser. No. 299,080

Int. Cl.[4] A63B *21/30*

U.S. Cl. 272—67 **2 Claims**

1. A hand exerciser comprising an elongated imperforate

cylindrical body constructed of resilient flexible material and having a substantially constant diameter throughout its length, said body including a cylindrical bore extending throughout its length and located in the center of the body, said body having flat ends perpendicular to the longitudinal axis of the body, the diameter of the body being substantially greater than the diameter of the bore to provide a radially thick body outwardly of the bore, said body having a length enabling it to extend substantially completely across the width of the palm of a hand of a user and a circumference enabling the fingers and thumb on the hand of a user to substantially encircle the body when the body is uncompressed thereby enabling the body to be compressed anywhere along its length or throughout its length by the user squeezing the body thereby exercising the hand, and a flexible retaining strap extending through the bore and encircling the back of the hand to retain the body against the palm of the hand even when the fingers and thumb are not in encir-



cling relation to the body, said strap having a width generally equal to the diameter of the bore to stabilize the strap in the bore, said body being constructed of cellular foam material with the bore through the body enabling compression of the body to a thin configuration by collapsing the bore as well as collapsing the cellulose foam material thereby enabling the hand to be tightly clinched to form a fist, said strap extending through the bore including overlapping ends and means adjustably interconnecting the overlapping ends of the strap to enable the strap to snugly encircle hands having different dimensions, the external surface of said body including a longitudinally extending ointment receiving and dispensing groove means, said groove means terminating in radially spaced relation to the bore and extending throughout the length of the body and oriented in facing contacting relation to the user's hand for applying ointment to the hand during cyclic compression of the body.

4,711,446

STILT

Orlan S. Nielsen, Box 101, Parker, Id. 83438, and Lawrence E. Nielsen, 1916 Amsterdam La., Modesto, Calif. 95356

Filed Feb. 25, 1986, Ser. No. 832,668

Int. Cl.[4] A63B *25/00*

U.S. Cl. 272—70.1 **9 Claims**

9. A stilt including an upright standard having upper and lower end portions and upstanding inner and outer longitudinal sides, said outer longitudinal side including transverse, horizontal outwardly opening adjustment grooves formed therein and spaced vertically along said lower end portion, a foot block including a first side opposing, abutted against and slidable along the inner side of said standard, said foot block including a second side remote from said standard, said second side including a transverse, horizontally outwardly opening support groove formed therein, an elongated closed loop-type bail closely encircled about said standard and block and including opposite end transverse portions thereof seated in one of said adjustment grooves and said support groove with said support groove spaced sufficiently below said one adjustment groove to enable one of said transverse portions to be displaced outward of the corresponding groove upon upward displacement of said block along said standard to a position with said support groove generally horizontally aligned with said one adjustment groove, and means carried by said standard adjacent each of said adjustment grooves and operable to releas-

ably close the corresponding adjustment groove against the displacement of the corresponding end member of said loop-type bail therefrom.

4,711,447

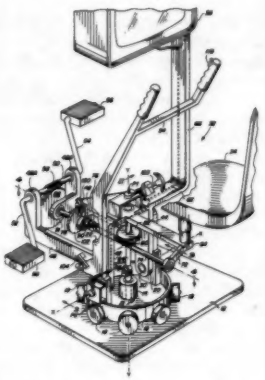
EXERCISE APPARATUS FOR USE WITH VIDEO GAME

Michael R. Mansfield, 3150 Shorewood La., #302, Fort Myers, Fla. 33907

Filed Dec. 23, 1985, Ser. No. 812,317

Int. Cl.[4] A63B *21/00*; A63G *31/16*

U.S. Cl. 272—73 **3 Claims**



1. An exercise apparatus for use in combination with a video game comprising:

a. a stationary base member disposed in a generally horizontal plane;

b. an assembly movably mounted on said base member, including (i) a seat for an operator and (ii) support means for mounting a video game facing said seat, said assembly being movable with respect to said base member in a plurality of directions;

c. mounting means intermediate said base and said assembly to permit said assembly to be moved relative to said base, said mounting means including a rotatable framework for supporting said assembly, said mounting means permitting 360 degrees of horizontal rotation of said framework and assembly in either of two opposing directions about a vertical axis centered on said base member;

d. operator-powered drive means for moving said assembly with respect to said base member, said drive means including a foot-operated crank wherein pedalling of the crank

by the operator in a forward direction casues said framework and assembly to move in one direction, and pedalling backward causes said assembly to move in an opposing direction, such movement requiring vigorous exercise by said operator; and

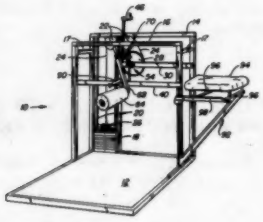
e. electrical sensing means connected to said mounting means responsive to the direction and extent of movements of said assembly with respect to said base member, for transmittal of information related to said movements to said video game.

4,711,448

LOWER BODY EXERCISING AND WEIGHT TRAINING DEVICE

Roger E. Minkow, 735 H St., Petaluma, Calif. 94952, and Julius M. Minkow, 69 Washington St., Brooklyn 1, N.Y. 11201

Filed Apr. 11, 1985, Ser. No. 722,226
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **10 Claims**



1. In a machine useable for exercising muscle and body joints the combination comprising:

(a) a frame including a base, a first and a second upright vertical support member,

(b) an adjustable set of gravity responsive weight elements movable in a vertical direction within said first upright support member,

(c) a rotatable shaft mounted at a fixed location on said first support member, and means connected to said shaft for converting rotary movement of said shaft to vertical movement of said weight elements,

(d) a movable rotatable shaft mounted on said second of said support members, means for moving said movable shaft vertically within said second support memer,

(e) machine user operable means adjustably supported on said movable rotatable shaft, said user operable means being adjustable in radial distance from said rotatable mounting of said rotatable shaft on said second support member, said adjustable support of said user operable means being rotatably adjustable to position said user operable means angularly about said movable rotatable shaft,

(f) and a flexible positive mechanical connection between said fixed location of said rotatable shaft mounted on said first support member and said movable rotatable shaft mounted on said second support member,

(g) said flexible position mechanical connection including:

(i) a universal joint connected to said rotatable shaft,

(ii) a universal joint connected to said movable rotatable shaft,

(iii) and an axially slideable positive connection between said universal joints,

(h) said machine user operable means being adjustably positioned with respect to said second support member to provide vertical, rotary and radial adjustment of said user operable means,

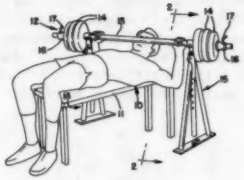
(i) and said machine user operable means being operable to adjust said flexible positive mechanical connection to said rotatable shaft to selectively cause vertical movement of said weight elements with either clockwise or counter-clockwise rotation of said rotatable shaft mounted at said fixed location on said first support member.

4,711,449

WEIGHT LIFTING SAFETY DEVICE

Douglas C. Ochab, 7712 W. Sunnyside Ave., Norridge, Ill. 60656

Filed Jan. 6, 1986, Ser. No. 816,625
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **12 Claims**



1. A weight lifting safety device adapted for use in bench-pressing exercises, said device comprising:

weight supporting bar means for grasping in a horizontal position by a user and for receiving weights on generally opposite ends thereof;

bar and weight support means depending vertically from said bar means adjacent opposite ends thereof to support said bar means and any weights thereon in predetermined elevated position relative to a supporting surface;

an attachment assembly fixed to the upper end of each support means and extending horizontally thereof, each said attachment assembly having a sleeve, said bar means extending through said sleeve of each of said attachment assemblies and being rotatable therein;

locking means on said bar associated with each attachment assembly to fix the positions of said support means longitudinally on said bar; and

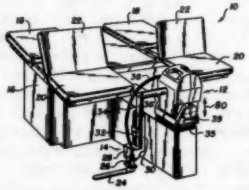
each of said locking means includes a pair of opposed semi-cylindrical plates provided with external spaced abutment means, fastening means for attaching said plates to said bar, said sleeve being received about each of said locking means between said spaced abutment means, said bar and said locking means being rotatable in said sleeves.

4,711,450

MULTI-MODE EXERCISING APPARATUS

Jim McArthur, 51 Leeder Avenue, Coquitlam, British Columbia, Canada V3K 3V5

Continuation of Ser. No. 427,121, Sep. 29, 1982. This application May 28, 1985, Ser. No. 738,447
Claims priority, application Canada, Jun. 1, 1982, 404235
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—129 **12 Claims**



1. A multi-mode exercising apparatus comprising

a central support housing,

a rotary actuator mounted to said support housing and adapted to be hydraulically driven in opposite rotational directions about a rotational axis, and including an output shaft extending along said rotational axis,

hydraulic pump means for pressurizing a hydraulic fluid,

servo valve means interconnected between said pressurized hydraulic fluid and said rotary actuator for controlling fluid flow in each direction through said actuator in response to an electrical input signal,

an arm extending radially with respect to said rotational axis and having one end thereof fixed to said output shaft, and an opposite end spaced radially from said rotational axis,

a slider slideably mounted to said arm and including locking means for releaseably positioning said slider at an adjustable location along the radial length of said arm,

a user engageable handle adapted to be engaged by the body of the user during use of said apparatus,

block means mounting said handle to said slider and such that said handle extends in a direction generally parallel to said rotational axis, said block means including load cell means for providing an electrical signal which is proportional to the magnitude of the force exerted by the user on said handle during use of said apparatus.

position sensing means for generating an electrical signal representative of the rotational position of said actuator, and

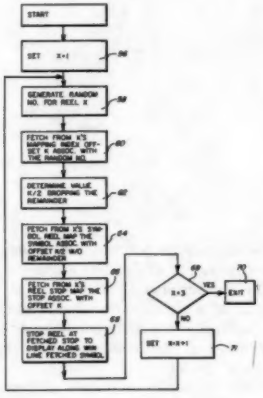
control means for controlling the input electrical signal to said servo valve means in response to the signals from said load cell means and said position sensing means and in accordance with a predetermined control program, and whereby the positioning of said load cell means immediately adjacent the user handle serves to effectively avoid any force component from the weight of said arm and said slider from being included in the output signal of said load cell means.

4,711,451

REEL MAPPING SCHEME FOR A GAMING DEVICE

Phillip Pajak, Western Springs; Victor Salmons, and Tony Chan, both of Chicago, all of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Jul. 29, 1986, Ser. No. 891,362
Int. Cl.[4] A63B *71/04*
U.S. Cl. 273—143 R **5 Claims**


START
SET X=1
GENERATE RANDOM NO. FOR REEL X
FETCH FROM X'S MAPPING INDEX OFFSET K ASSOC. WITH THE RANDOM NO.
DETERMINE VALUE K/Z DROPPING THE REMAINDER
FETCH FROM X'S SYMBOL REEL MAP THE SYMBOL ASSOC. WITH OFFSET K/Z W/O REMAINDER
FETCH FROM X'S REEL STOP MAP THE STOP ASSOC. WITH OFFSET K
STOP REEL AT FETCHED STOP TO DISPLAY ALONG WIN LINE FETCHED SYMBOL
X=3
YES
EXIT
NO
SET X=X+1

1. In a gaming device having a rotating symbol bearing reel with n stop positions associated with each symbol, a control system for stopping said reel to display a randomly selected symbol along a win line comprising:

reel map means for storing, for each stop on the reel, data representing the stop at an addressable location in the reel map means corresponding to the location of the stop on the reel to provide a map of the reel stops, the data storage location for each stop having an associated, unique address offset value k which differs from the k offset values associated with an adjacent stop or stops for the same symbol by a unit value;

symbol map means for storing, for each symbol on said reel, data representing the symbol at an addressable location in the symbol map means corresponding to the location of the symbol on the reel to provide a map of the symbols, the data storage location for each symbol having an associated, symbol address offset equal to k/n without the remainder where k is one of the n reel map offset values associated with the symbol's n stops;

mapping index means for storing one or more k offset values for each symbol on said reel where each k offset value stored in the index means points to the symbol in the symbol map means whose associated symbol address offset equals k/n without the remainder, each k offset value being stored in the mapping index means at a location having an associated index offset value;

means for randomly generating a number representing an index offset value for said mapping index means; and

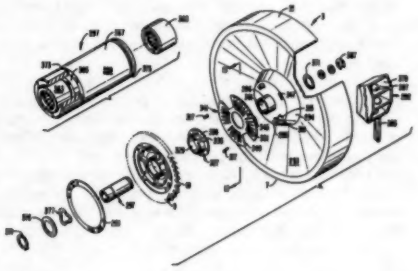
means for stopping said reel at the stop position whose associated k offset value is the value stored in the mapping index means at the address having the index offset value represented by said random number to display along the win line the symbol whose associated symbol address offset value is equal to k/n without the remainder.

4,711,452

AMUSEMENT MACHINE

Peter D. Dickinson, and Robert A. Luciano, both of Reno, Nev., assignors to International Game Technology (IGT), Reno, Nev.

Division of Ser. No. 664,185, Oct. 24, 1984, Pat. No. 4,635,937.
This application Aug. 11, 1986, Ser. No. 895,550
Int. Cl.[4] A63F *5/04*
U.S. Cl. 273—143 R **10 Claims**



1. A reel assembly for use with an amusement machine, comprising:

a reel and sprocket mounted for relative rotational movement about a common axis;

means bridging said reel and sprocket for preventing relative rotational movement in a predetermined rotational direction when said reel and sprocket are in a predetermined angular orientation, and for permitting relative rotational movement from said predetermined angular orientation in the opposite rotational direction;

resilient means engaging each of said reel and sprocket for resisting relative rotational movement opposite to said predetermined direction when a force in that direction is applied and returning said reel and sprocket to said predetermined angular orientation when the force subsides;

a clutch disc mounted coaxially with and interposed between opposing hub faces of said reel and sprocket;

said clutch disc comprising an inner and outer portion, said inner portion contacting said opposed hub faces on both sides of said disc and said outer portion extending radially outward beyond at least one of said hub faces, said clutch disc further comprising a plurality of slots extending radi-

ally outwardly from said inner to said outer portion for discharging accumulated residue from said inner portion; and

means for urging said opposed hub faces axially towards each other against said clutch disc.

4,711,453

DICE PYRAMID TALLY BOARD AND GAME

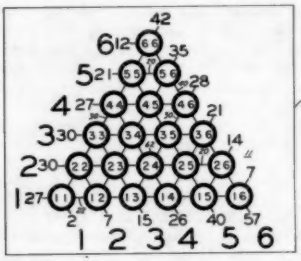
Michael H. Saint Ive, Englewood, Colo., assignor to Stephen Kal, Denver, Colo.

Filed Jul. 20, 1981, Ser. No. 284,926

The portion of the term of this patent subsequent to Apr. 5, 1997, has been disclaimed.

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—268 **3 Claims**



1. A flat playing board having a triangular grid defined by a first set of 6 parallel equidistant spaced horizontal lines which intersect a second set of 6 parallel equidistant spaced vertically oblique lines, oblique to the right with the horizontal lines, which also intersect a third set of 6 parallel equidistant spaced vertically oblique to the left lines and the 6 lines vertically oblique to the right lines, oblique to the left with the horizontal lines, the lines in each set extending at an angle to the lines of the other sets;

a row of numbers from 1 through 6 along the bottom of the triangular grid with the numbers positioned from left to right to correspond to the intersection of the 6 vertically oblique to the left lines and the 6 lines vertically oblique to the right lines with the horizontal line; and,

a row of numbers from 1 through 6 along the left edge of the triangular grid with the numbers positioned from bottom to top to correspond to the intersection of the 6 horizontal lines with the 6 vertically oblique to the left lines and the 6 lines vertically oblique to the right lines.

4,711,454

BINGO GAME INVOLVING PROMOTIONAL COUPONS

Maynard E. Small, 105 Ward Pkwy., Apt. 507, Kansas City, Mo. 64112

Continuation of Ser. No. 699,311, Feb. 7, 1985, Pat. No. 4,619,457, which is a continuation-in-part of Ser. No. 385,840, Jun. 7, 1982, Pat. No. 4,509,759, which is a continuation-in-part of Ser. No. 273,259, Jun. 12, 1981, Pat. No. 4,342,457, which is a continuation of Ser. No. 79,189, Sep. 26, 1979, Pat. No. 4,285,520. This application Oct. 27, 1986, Ser. No. 923,346

Int. Cl.[4] A63F *3/06*

U.S. Cl. 273—269 **16 Claims**

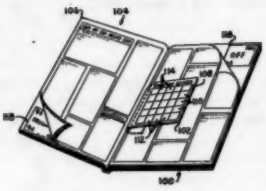
12. A game for players of the type known as "bingo" comprising:

(a) a set of free-standing advertising publications comprising a plurality of pages;

(b) a set of playing cards, one of said set provided with each copy of said publication; each of said cards having a playing matrix divided into several columns and rows forming a plurality of playing squares with individual area indicia contained therein;

(c) each of said free-standing publications including a plurality of coupons common to all players printed therein; at least a portion of said coupons being positioned at various isolated locations throughout said publication; each coupon bearing individual coupon indicia;

(d) said area indicia and said coupon indicia being cooperatively related, in that selected indicia from the coupon



indicia set are matched area indicia with selected indicia from the area indicia set such that said matched area indicia describe at least a complete row or column or diagonal on said playing card grid; whereby each player is urged to scan the pages of said publication to determine the presence of said coupons in order to produce said predetermined pattern of matched area indicia.

4,711,455

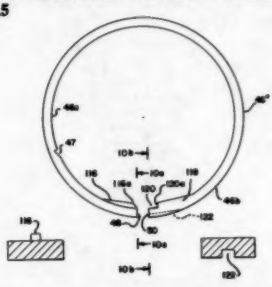
GASKET FOR USE IN MANHOLES AND INCLUDING CLAMPING BAND HAVING COOPERATING PROJECTIONS AND GROOVES FOR PREVENTING RELATIVE AXIAL MOVEMENT OF THE OPPOSING ENDS OF THE CLAMPING BAND DURING INSTALLATION AND FOR FACILITATING EXPANSION BY AN EXPANSION JACK

Jack Ditcher, and James A. Westhoff, both of Langhorne, Pa., assignors to A-Lok Products, Inc., Tullytown, Pa.

Filed Sep. 23, 1985, Ser. No. 778,690

Int. Cl.[4] B23P *19/00;* **F16J** *15/10;* **F16L** *5/02, 21/08*

U.S. Cl. 277—9.5 **9 Claims**



1. A gasket assembly for providing a watertight seal within an opening including an annular compressible gasket having inner and outer peripheral surfaces and an annular clamping band formed of a plastic material substantially impervious to corrosive influences normally encountered in sewage systems and arranged to be positioned to engage the inner peripheral surface of said gasket;

said clamping band having inner and outer peripheral surfaces, said outer peripheral surface engaging the inner periphery of said gasket;

said clamping band having a discontinuity to define first and second free ends thereof, whereby said first and second free ends are moved into abutment with one another when the clamping band is expanded against said gasket to maintain said clamping in a locked position and maintain said gasket under compression, the interactive forces between the compressed gasket and the clamping band serving to retain the clamping band in the locked position against the inner peripheral surface of said gasket, the

outer peripheral surface of said gasket being pressed into intimate engagement with the gasket supporting surface of said opening;

said clamping band having a projection along one of its inner and outer peripheries and adjacent to one of said free ends and a groove along the other one of its inner and outer peripheries and adjacent the remaining one of said free ends, for slidably receiving said projection when the ends of said clamping band are overlapped preparatory to expansion of the band, to prevent axial movement of the ends of the clamping band relative to one another as the clamping band is expanded towards the locked position.

4,711,456

GASKET FOR AN INTERNAL COMBUSTION ENGINE

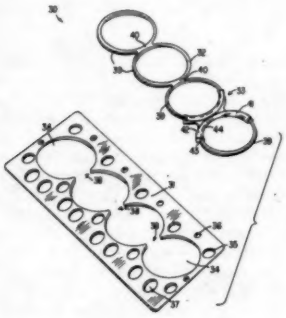
Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 936,866

Claims priority, application Japan, Jul. 29, 1986, 61-116114

Int. Cl.[4] F16J *15/12*

U.S. Cl. 277—235 B **13 Claims**



1. A gasket for an internal combustion engine with a plurality of through holes therein, comprising:

a main seal member having a plurality of openings corresponding to the through holes of the engine, said openings being slightly larger than the through holes, and at least one communicating portion situated between the adjacent two openings for providing communication between the two openings,

a sealing device having a plurality of cylindrical portions to be situated in the openings of the main seal member, and at least one intermediate portion to be situated in the communicating portion of the main seal member, said cylindrical portions and intermediate portion being integrally formed together, and

means for substantially covering the sealing device and securely connecting the same to the main seal member.

4,711,457

DRILL CHUCK FOR HAND-HELD TOOLS

Erich Wezel, Frickenhausen, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

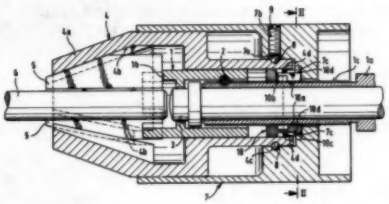
Filed Jun. 6, 1986, Ser. No. 871,710

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520324

Int. Cl.[4] B23B *31/12*

U.S. Cl. 279—65 **5 Claims**

1. Drill chuck for securing a tool in a hand-held device, such as a percussion drill, a hammer drill or similar device, comprising an axially extending chuck member having a leading end and a trailing end, said chuck member having an axially extending radially outer surface with an axially extending thread formed in the outer surface, a guide sleeve laterally enclosing an axially extending part of said chuck member from the leading end toward the trailing end thereof, at least two clamping jaws fitted into the leading end of said chuck member and extending in the axial direction of the chuck member outwardly from the leading end thereof and located within said guide sleeve, said guide sleeve having a support surface engageable with said clamping jaws for determining the radial position of said clamping jaws, a sleeve-like adjustment adapter laterally enclosing an axially extending part of said guide sleeve and said chuck member, said adjustment adapter being axially displaceable relative to said chuck member and being secured to said guide sleeve for axially displacing said guide member and effecting radial displacement of said clamping jaws, wherein the improvement comprises a coupling member located within and in engagement with said adjustment adapter and encircling said chuck member, said coupling member



including a radially displaceable part selectively threadedly engageable with said thread on said chuck member, and said thread on said member having a small pitch, said coupling member has at least one radially displaceable threaded segment for selective engagement and disengagement with said thread on said chuck member, said coupling member comprises a plurality of said threaded segments arranged serially in the circumferential direction, and said coupling member including spring means for biasing said threaded segments radially outwardly from said thread on said chuck member, and said coupling member is an axially extending sleeve-shaped member having a reduced diameter section intermediate the axial ends of said coupling member with slits formed in said coupling member for separating said threaded segments and for dividing said reduced diameter sections into individual fingers acting as spring elements for said threaded segments.

4,711,458

ROLLER SKATE

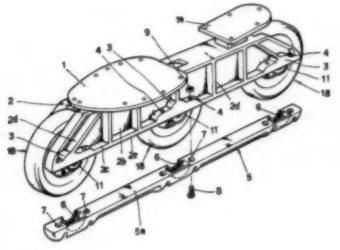
Hyun J. Shim, 350-39, Sangdo 3-dong, Dongjak-Ku, Seoul, Rep. of Korea

Filed Oct. 9, 1985, Ser. No. 785,946

Claims priority, application Rep. of Korea, Jul. 12, 1985, 8789/1985[U]

Int. Cl.[4] A63C *17/04*

U.S. Cl. 280—11.22 **7 Claims**



1. A roller skate comprising:

a bottom plate for supporting a shoe thereon;

a pair of upper frames extending longitudinally in parallel

with each other on the lower surface of said bottom plate and formed integrally with said bottom plate, each upper frame having a length longer than that of said bottom plate and three semi-circular bearing boxes disposed at the front end, rear end, and middle portions thereof;

a pair of lower frames extending along substantially the length of said corresponding upper frames attached to respective lower portions of said upper frames by means of bolts and nuts, each lower frame having an upper surface corresponding to the lower surface of each upper frame and three semi-circular bearing boxes corresponding to respective bearing boxes of each upper frame;

three bearings disposed within corresponding bearing boxes of each upper frame and each lower frame, each bearing carrying a damping pad along the upper portion thereof; and

three rollers arranged in a line between said upper and lower frames, each roller having a shaft formed to be unitary therewith, both ends of said

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4,711,459

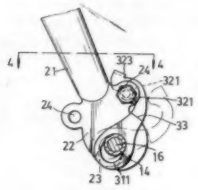
QUICK-RELEASE HUB RETENTION DEVICE

King Liu, No. 19, Shun Fan Road, Ta Chia Town, Taichung Hsien, Taiwan

Filed Dec. 29, 1986, Ser. No. 946,779

Int. Cl.[4] B62K *25/02*

U.S. Cl. 280—279 **5 Claims**



1. An improved safety mounting device for a bicycle quick-release hub having a wheel axle engageable in open-ended slots in the lower end portions of the legs of the front fork of the bicycle for receiving said axle, and a quick-release unit including adjustable retainer members movable relative to said axle longitudinally thereof for clampingly retaining said axle in said slots; each of said legs including a protrusion on an outward surface thereof above said slot, said safety mounting device comprising a pair of rigid clips, wherein each of said clips comprises:

a lower end pivotally mounted on said axle; and

parallel upper and lower portions extending radially of said axle, said upper portion having a curved free end for hooking over said protrusion to mount said axle on said legs of said front fork and being offset from said lower portion in an axial direction of said axle and being spaced in said axial direction from said lower portion at a distance slightly larger than the thickness of the lower end portion of said leg engaged therewith such that when said free end is hooked over said protrusion, said upper and lower portions of said clip respectively abut opposite sides of said lower end portion of said leg to prevent accidental separation of said hub from said front fork despite release of said adjustable retainer members.

4,711,460

MOUNTED IMPLEMENT HITCH FOR FARM TRACTORS

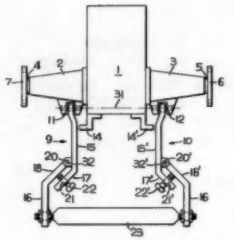
Klaus Schmittbetz, Cologne, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 863,110

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517489

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—460 A **5 Claims**



1. In combination with a farm tractor, an implement hitch comprising:

a pair of longitudinally extending lower draft arms with first parts connected to the tractor and second parts adapted for connection to an implement,

means pivotally interconnecting said first parts to said second parts, respectively, for relative lateral swinging movement of said second parts about first and second laterally spaced vertical axes, respectively,

a first adjustment element adjustably mounted on one of said parts of one of said draft arms at a location spaced from said first vertical axis, said first adjustment element being operatively interposed between said parts of said one draft arm and operable to adjust said parts about said first vertical axis, and a second adjustment element adjustably mounted on one of said parts of the other of said draft arms at a location spaced from said second vertical axis, said second adjustment element being operatively interposed between said parts of said other draft arm and operable to adjust said parts about said second vertical axis.

4,711,461

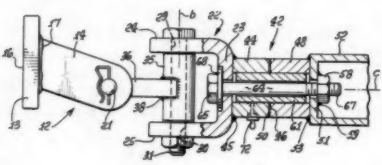
THREE-AXIS TRAILER HITCH HAVING IMPROVED ROTATABLE COUPLING BETWEEN VEHICLE AND TRAILER

John P. Fromberg, Covina, Calif., assignor to Positive Connections, Inc., Pasadena, Calif.

Filed Apr. 17, 1986, Ser. No. 853,187

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—494 **6 Claims**



1. A trailer hitch for providing coupling about three independent axes between a towing vehicle and a trailer, comprising in combination:

(a) a universal coupling having a first U-shaped yoke member, a second U-shaped yoke member, and a pair of hollow cylindrical sections joined together in the form of a cross,

said first U-shaped yoke member having a base plate adapted for attachment to the towing vehicle and a pair of spaced-apart, parallel arms extending from said base plate for supporting one of said pair of joined hollow cylindrical sections for limited angular movement about a first axis; said second U-shaped yoke having a base portion and having a pair of spaced-apart, parallel arms extending from said base portion for supporting the other of said pair of joined hollow cylindrical sections for angular movement about a second axis inclined ninety degrees with respect to said first axis;

(b) a first, short, hollow cylindrical member having a forward end portion securely joined to the base portion of said second U-shaped yoke member, said first, short, hollow cylindrical member extending from the base portion in a direction opposite to that of the pair of spaced-apart, parallel arms; said first, short, hollow cylindrical member having a smooth rear-end surface perpendicular to the longitudinal axis of said first, short, hollow cylindrical member;

(c) a second, short, hollow cylindrical member having a smooth front-end surface perpendicular to the longitudinal axis of said second, short, hollow cylindrical member, said second, short, hollow cylindrical member having a rear-end portion adapted for secure attachment to a trailer; each of said first and second short, hollow cylindrical members having a smooth cylindrical inner wall surface forming a bore;

(d) a hollow, cylindrical sleeve member coaxially positioned within and extending between said first and second short, hollow cylindrical members, said hollow, cylindrical sleeve member having a diameter slightly less than the diameter of the bores of said first and second short, hollow cylindrical members, and a length less than the total length of said first and second short, hollow cylindrical members; and

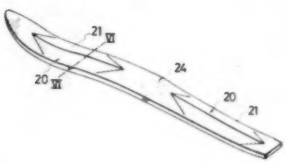
(e) a bolt having a head at one end and a threaded portion at its opposite end, said bolt extending axially between the opposite ends of said first and second short, hollow cylindrical members and through the center of said hollow, cylindrical sleeve member to retain the smooth rear-end surface of said first short, hollow cylindrical member in abutment with the smooth front-end surface of said second short, hollow cylindrical member; said hollow, cylindrical sleeve member maintaining axial alignment between said first and second short, hollow cylindrical members and providing a smooth bearing surface for relative rotation of said first short, hollow cylindrical member with respect to said second short, hollow cylindrical member about a longitudinal axis perpendicular to said second axis.

4,711,462

INJECTION SKI AND A METHOD OF MANUFACTURING SAME

Keijiro Hayashi, Takatsuki, and Toshimi Awano, Ohogaki, both of Japan, assignors to Mizuno Corporation, Osaka, Japan

Continuation of Ser. No. 476,789, Mar. 18, 1983, abandoned. This application Jun. 25, 1986, Ser. No. 880,347
Claims priority, application Japan, Mar. 20, 1982, 57-45274
Int. Cl.[4] A63C *5/12*
U.S. Cl. 280—610 **5 Claims**



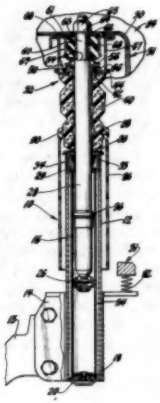
1. An injection ski comprising a pair of spaced upper and lower composite elements having spaced opposite edges and having an expanded plastic interposed between said upper and lower composite elements, including said spaced edges, said upper composite element including an upper surface member and a reinforcing member bonded to one another in mating relationship, with the upper surface member and the reinforcing member both being formed with mating longitudinally spaced forward and rear convex portions, and both being of essentially planar mating construction between the longitudinally spaced forward and rear convex portions to define an essentially planar intermediate surface area where a ski binding is secured.

4,711,463

VEHICLE SUSPENSION STRUT AND UPPER MOUNT ASSEMBLY THEREFOR

Joseph J. Knable, Fenton, Mich.; Donald C. Ferdelman, Kettering, Ohio, and Gerald M. Bojanowski, Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1986, Ser. No. 871,776
Int. Cl.[4] B60G *11/42*
U.S. Cl. 280—668 **6 Claims**



1. In a vehicle having suspension spring means operatively interposed between a road wheel assembly and a vehicle body, a suspension strut assembly for mounting said vehicle road wheel to support structure associated with said body and movable in jounce and rebound, a cylinder tube having a hydraulic fluid therein, a support tube disposed around said cylinder tube and having a lower end operatively connected to the vehicle road wheel assembly, a valved piston operatively mounted for reciprocating movement in said cylinder tube having a piston rod operatively connected thereto and extending out of said cylinder tube and said support tube, said piston rod being operatively connected to said vehicle body so that said piston controls vehicle ride motions, the improvement comprising an upper strut mount assembly, a first mounting plate fixed to said support structure, a piston rod bushing of resilient material having an outer wall operatively secured to said mounting plate and having an internal wall, means operatively securing said internal wall to an upper portion of said piston rod, a second mounting plate secured with respect to said support structure, resilient cushion means secured to said second mounting plate and spaced from said piston rod bushing yieldably supporting said outer support tube, a rate washer mounted on said piston rod immediately below said piston rod bushing for directly contacting and working said bushing in shear and compression during jounce motions of said strut and said piston rod while said cushion means is compressed by said cylinder tube to dissipate jounce loads said cushion means being

subjected to compression load by said rate washer to dissipate rebound loads.

4,711,464

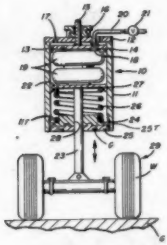
WHEEL LIFT

Michael Bilas, 2730 Columbians-New Castle Rd., New Springfield, Ohio 44443

Continuation-in-part of Ser. No. 743,982, Jun. 12, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 927,962

Int. Cl.[4] B60G *17/00*

U.S. Cl. 280—704 **7 Claims**



1. An auxiliary wheel lift for use on a vehicle to provide adjustable additional load capacity comprising a housing secured to said vehicle, a vertically movable head plate within said housing and a attached lift rod extending therefrom, a partition movably positioned within said housing, an air spring positioned on one side of said head plate between said head plate and said partition, means for vertically moving said partition within said housing limiting the travel of the attached lift rod, an adjustable housing insert having a guide bore centrally located on its vertical axis registerably receiving said lift rod, a coil spring positioned on the opposite side of said head plate between said head plate and said housing insert, a wheel lift and axle assembly secured to the free end of said lift rod, means for adjustably positioning said housing insert axially in said housing, and means to activate said air spring comprising a compressed air source, supply lines and a valve in said supply lines.

4,711,465

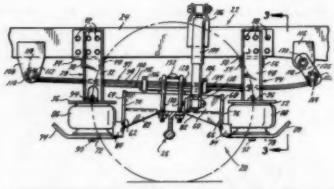
SUSPENSION SYSTEM WITH SWAY GUIDE

John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Filed Jul. 8, 1985, Ser. No. 752,807

Int. Cl.[4] B60G *11/46*

U.S. Cl. 280—712 **26 Claims**



1. A suspension system for supporting a vehicle chassis on an axle comprising resilient spring means, means to attach a first end of the resilient spring means to the axle, means to attach a second end of the resilient spring means to the vehicle chassis, a longitudinally extending element having two ends, one end of the element being connected to the chassis and having a portion spaced from said one end and connected to the axle with a section between said one end and said portion extending between the chassis and the axle and movable vertically with vertical movements of the axle, and means comprising two rigid generally vertical, laterally spaced parallel walls supported by the chassis and positioned on opposite sides of and in close proximity to the element intermediate said portion and one of said ends, for restricting lateral movement of the element and thereby limit sway of the chassis in relation to the axle, the walls being free of connections to the element to allow substantially uninhibited vertical movement of the element.

4,711,466

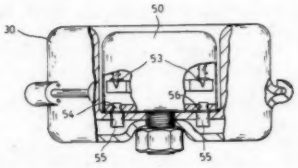
METHOD AND APPARATUS FOR GAS GENERATOR INITIATION FROM EXTERNAL SENSOR

Allen K. Breed, Boonton Township, Morris County, N.J., assignor to Breed Corporation, Lincoln Park, N.J.

Filed Jun. 27, 1986, Ser. No. 879,413

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—741 **13 Claims**



1. A method for initiating gas generation in an airbag inflator for a vehicle which comprises:

providing a gas generating pressure vessel having at least one orifice containing a percussion primer, and at least one exit orifice for releasing gas generated within said vessel and said vessel containing a gas generating material;

providing a sensor adapted for mounting on said pressure vessel having an instrumentality to be operated in response to the crash of said vehicle whereupon said instrumentality activates said percussion primer to initate gas generation within said pressure vessel without a passage from which generated pressurized gas can escape from said pressure vessel.

4,711,467

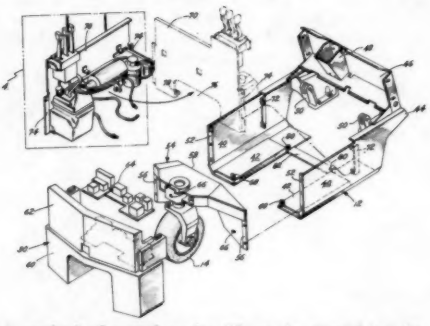
METHOD AND MEANS FOR LIFT TRUCK ASSEMBLY AND SERVICING

David H. Link, and Juan R. Lopez, both of Battle Creek, Mich., assignors to Clark Equipment Company, South Bend, Ind.

Continuation-in-part of Ser. No. 818,569, Jan. 13, 1986, abandoned. This application Nov. 24, 1986, Ser. No. 934,519

Int. Cl.[4] B62D *21/12;* **B21D** *39/00;* **B23P** *11/00*

U.S. Cl. 280—785 **18 Claims**



1. A method of manufacturing lift trucks comprising the

steps of moving a truck main frame from station to station along an assembly line at each of which stations one or more truck parts or assemblies is assembled on the frame, mounting on a main frame plate means remote from the assembly line a plurality of truck components, transporting to the assembly line at a preselected station thereof said main frame plate means, and mounting in the truck frame said main frame plate means with said truck components which are mounted thereon.

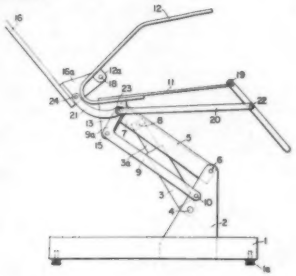
12. A lift truck comprising a main frame, a main frame plate means adapted to be secured to the main frame generally centrally and transversely thereof, a plurality of truck components mounted on said frame plate means, said main frame plate means being disconnectable from rigid connection with said main frame, and pivot means connecting said frame plate means to said main frame such that when disconnected said frame plate means may be pivoted in a predetermined direction.

4,711,468

GUIDE RAIL FOR SEAT BELT DEVICE

Noritada Yoshitsugu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 16, 1986, Ser. No. 874,646
Claims priority, application Japan, Jun. 21, 1985, 60-94333[U]
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—804 **3 Claims**



1. A guide rail arrangement for a seat belt device having a slider slidably movably provided in a slot of the guide rail installed on a roof side inner panel, and a webbing mounted at the end thereof on the slider for restricting an occupant, said guide rail comprising:

a recessed portion formed on the roof side inner panel and protruded toward a passenger compartment, a bottom surface of the recessed portion being inclined toward the outside of the passenger compartment at an angle greater than that of the roof side inner panel away from said passenger compartment,

the guide being rail secured to the protruded bottom surface of the recessed portion of the roof side inner panel at the side of the passenger compartment, and

a groove formed on an inner surface of the guide rail through which the slider moves, said groove being inclined toward the outside of the compartment at an angle at least as great as that of the bottom surface of the recessed portion toward the outside of the compartment.

4,711,469

BOOKCOVER AND BINDING METHOD

Gerald D. Bogar, 111 Ramble La., Suite 105, Austin, Tex. 78745

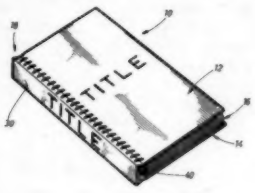
Filed Jul. 11, 1986, Ser. No. 884,477
Int. Cl.[4] B42D *1/00*
U.S. Cl. 281—25 A **15 Claims**

15. A bookcover comprising:

front and back interconnected sections of generally rigid material, each section having a flat spine tab, a margin adjoining the spine tab, and a cover separated from the margin by a crease line;

a plurality of holes in each margin and cover;

mechanical binding means extending through the holes in the margins and covers for interconnecting the sections,



the cover and margin of each section being operable to shift relative to each other along said crease line to allow opening and closing of the cover,

the spine tabs being overlapped and adhesively secured to each other to form a rigid, flat spine adjacent the mechanical binding means.

4,711,470

UTILITY CONNECTION BAR

Steven Scahill, 4347 Grace Ct., Rohnert Park, Calif. 94928

Filed Apr. 6, 1987, Ser. No. 34,551
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—30 **8 Claims**

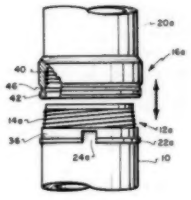
1. A utility connection bar, which comprises a plastic bar, threaded ends perpendicular to said plastic bar and extending upward from a top of said bar, said plastic bar having a discontinous bottom with a plurality of channels in the bottom.

4,711,471

NON-CLOCKING CONNECTOR WITH LOCKING ANTI-ROTATION TABS

Joseph W. Pallini, Jr., and Lionel J. Milberger, both of Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Mar. 20, 1986, Ser. No. 841,655
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—81 **9 Claims**



1. In a connector comprising a box with internal threads and a pin with external threads adapted to be threaded together to form a joint, the improvement comprising,

an external peripheral groove on the outside of the box below the threads, said outside being otherwise a uniform uninterrupted surface until a locking tab is formed thereon,

an internal groove on the inside of the box below the threads

in the area of the external groove, said internal and external grooves thereby thinning the wall of the box and forming peripheral shear lines,

a pin with at least one longitudinal slot thereon, such that when the connector is made up, the thinned wall of the box overlaps the longitudinal slot on the pin,

a locking tab formed on said box by bending the thin wall radially inwardly into the longitudinal slot and shearing the thinned wall pheripherally at said peripheral shear lines in a shear pattern whereby the locking tab engages the longitudinal slot to lock the box and pin together against relative rotation.

4,711,472

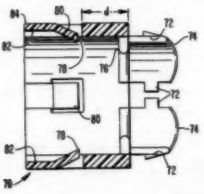
CONNECTOR FOR NON-METALLIC CONDUIT

Kenneth R. Schnell, South Bend, Ind., assignor to Hubbell Incorporated, Orange, Conn.

Filed Sep. 2, 1986, Ser. No. 902,580

Int. Cl.[4] F16L *5/00*

U.S. Cl. 285—162 **3 Claims**



1. A connector for attaching non-metallic conduit to a wall or another conduit, the non-metallic conduit being of the type having an exterior surface characterized by a plurality of alternating annular protrusions and recesses, the connector comprising

a cylindrical sleeve having an inner diameter slightly larger than the external diameter of the conduit and an axial length at least as great as the axial length occupied by three of said annular protrusions;

a stop wall at one end of said sleeve for limiting the insertion depth of said conduit into said sleeve, said stop wall having a central opening therethrough to permit the passage of wires from within said conduit;

a latch formed in said sleeve, said latch comprising means defining a generally U-shaped slot through the wall of said sleeve, the ends of said slot pointing axially away from said stop wall, said slot forming a resilient latch tab in the wall of said sleeve, said tab being inclined inwardly from the surrounding sleeve wall so that the distal end of said tab engages a protrusion at the end of a piece of inserted conduit and resists extraction of said conduit from said sleeve;

a plurality of hook members extending axially away from the other side of said stop wall from said sleeve, said hook members being formed to engage the edges of an opening in a substantially planar barrier, each of said hook members including

an arcuate, axially extending resilient wall segment substantially concentric with said central opening in said stop wall, and

a tooth formed on the exterior of said wall segment, said tooth having an inclined surface sloping outwardly away from the distal end of said arcuate wall segment and a radial surface facing said stop wall,

said hook members together forming an annular recess to receive the wall of a junction box around an opening therethrough,

each said arcuate wall segment being spaced from the next adjacent arcuate wall segment by a gap, said connector further comprising

blocking means interposed between said wall segments adjacent each said gap for preventing a wire inserted through said connector from passing into any of said gaps and rubbing against an exposed portion of the edges of said opening in which said connector is installed to thereby minimize the possibility of damage to the insulation of said wire.

4,711,473

COUPLING PIPES

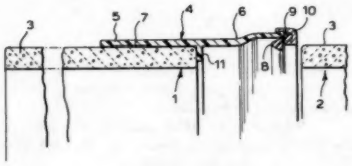
John B. Glover, Huddersfield, Great Britain, assignor to The Hepworth Iron Company Ltd., Stocksbridge, England

Filed Sep. 29, 1986, Ser. No. 912,822

Claims priority, application United Kingdom, Sep. 30, 1985, 8524006

Int. Cl.[4] F16L *21/00*

U.S. Cl. 285—235 **14 Claims**



1. A socket-ended pipe comprising a pipe length, a sleeve of flexible resilient shrinkable thermoplastics material partly embracing and partly protruding beyond an end of the pipe length, for receiving a spigot end of a further pipe length, and a resilient annular sealing member on the external circumference of the said socketed end, trapped between the external surface of the pipe length and the internal surface of the plastics sleeve, the plastics sleeve having been shrink-fitted over the said pipe end and sealing member under externally applied compressive stress whereby the said sealing member is maintained under compression.

4,711,474

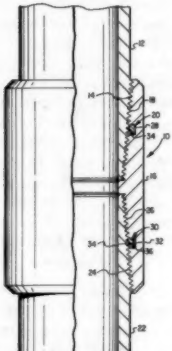
PIPE JOINT SEAL RINGS

David H. Patrick, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 21, 1986, Ser. No. 921,097

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—332.3 **26 Claims**



1. In a threaded pipe joint comprising a pipe section including an external threaded portion and a pipe fitting including an internal threaded portion matingly engaging said external

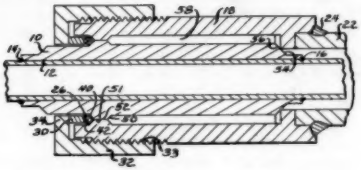
threaded portion wherein at least one polymeric material seal ring means is positioned in at least one recess positioned in at least one of said threaded portions and matingly engages the other threaded portion, the improvement comprising positioning a softer polymeric material on the portion of said polymeric material seal ring opposite the surface of said polymeric material seal ring engaging said other threaded portion.

4,711,475

HIGH PRESSURE FITTING

Dobrila Velisavljevic, 923 S. Jackson, Waukegan, Ill. 60085

Filed Aug. 2, 1985, Ser. No. 761,979
Int. Cl.[4] F16L *21/04*
U.S. Cl. 285—348 **1 Claim**



1. A coupling comprising:

a first sleeve adapted to be disposed on a first tube and sealed thereagainst, said sleeve having an extertior surface provided with an annular frusto-conical surface;

a second sleeve of larger diameter than said first sleeve and adapted to be disposed in sealed relation on a second tube of larger diameter than said first tube and nominally concentric thereabout, said second sleeve having an annular interior frusto-conical surface and being disposed about said first sleeve;

mating frusto-conical surfaces on said sleeves axially remote from said annular frusto-conical surfaces for axially aligning said annular frusto-conical surfaces to define a split, generally V-shaped annular, axially opening groove between said sleeves;

an O-ring seal in said groove and abutting both of said annular frusto-conical surfaces;

a compressing ring engaging said O-ring seal oppositely of said annular frusto-conical surfaces; and

a nut threaded to said second sleeve and engaging said compressing ring oppositely of said O-ring seal and rotatable to apply an axially directed force to said compressing ring to urge said O-ring seal into said V-shaped groove and sealing contact with both of said annular frusto-conical surfaces.

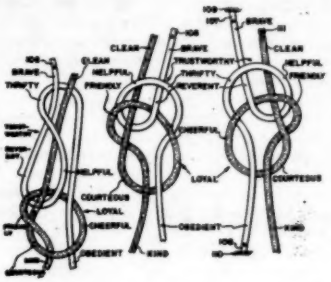
4,711,476

KNOT

Alden W. Hanson, Midland, Mich., assignor to Helen L. Hanson, Midland, Mich.

Filed Nov. 21, 1986, Ser. No. 933,153
Int. Cl.[4] D04G *5/00*; B65H *69/04*
U.S. Cl. 289—1.2 **19 Claims**

1. A knot or bend having front and rear sides and comprising an overhand knot (Loyal) forming a first bight (Cheerful) from opposite ends of which first (Clean) and second (Kind) sections extend in different directions, a crossing knot (Trustworthy) forming a second bight (Helpful) from which third (Brave) and fourth (Obedient) sections extend in different directions, said first and second bights being entwined, said first (Clean) and third (Brave) sections extending alongside one another and passing through said second bight (Helpful) in a direction from one side of said knot or bend to its other side, and said second (Kind) and fourth (Obedient) sections extending alongside one another and passing through said first bight (Cheerful) in a



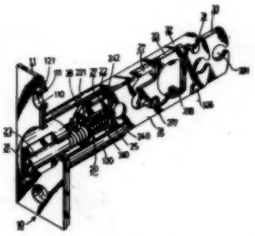
direction from said other side of said knot or bend to said one side thereof.

4,711,477

DUPLEX LATCH BOLT MECHANISM

Yaw-Shin Fann, and Rong-Faa Wu, both of Chia-Yi, Taiwan, assignors to Tong Lung Metal Industry Co., Ltd., Chia-Yi, Taiwan

Filed Jan. 7, 1986, Ser. No. 817,422
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—169.14 **14 Claims**



1. A duplex latch-bolt mechanism, for use with a manually operated latch-handle assembly that has a handle, a latch-bolt actuator and at least one mounting element and that is adapted to mount in one or more transverse apertures formed in a door to receive the actuator and mounting element, using either of two standard backsets; and for use with a latch-bolt case that has a rear end, and that is adapted to mount in a longitudinal bore formed in the edge of such a door and communicating with the transverse apertures; and for use with a latch-door unit that is installed in the case and includes a bolt head and a retractor lever; said mechanism comprising:

means for retracting such bolt head in response to operation of such handle, said means having:

a front portion that is movably disposed in such latch-bolt case and engaged with such retractor lever, and

a rear portion that is adapted, at two selectable locations longitudinally thereon, for operative engagement with such latch-bolt actuator; and

a connecting device appended at the rear end of such latch-bolt case and forming a track for longitudinal motion of the retracting means, and having:

access means for effecting access of such actuator to the retracting means, for operative engagement of such actuator with the retracting means at either of said two selectable locations, and

including telescoping means for defining two selectable positions longitudinally relative to such door edge and for receiving such latch-handle assembly mounting element at

either of the two positions, to stabilize the connecting device with respect to such latch-handle assembly and such door;

said telescoping means, when defining and receiving at the selectable position that is relatively closer to such door edge, being collapsed longitudinally so that the connecting device after installation does not extend substantially beyond the mounting element;

said telescoping means, when defining and receiving at the selectable position that is relatively further from such door edge, being extended longitudinally so that the connecting device for installation reaches to the mounting element;

the two selectable locations on the rear portion of the retracting means being mutually spaced apart longitudinally by a distance substantially equal to the difference between such two standard backsets; and

the two selectable positions defined by the telescoping means being mutually spaced apart longitudinally by the same distance;

whereby such a door can be prepared for installation of the latch-blt mechanism, in conjunction with such latch-bolt case, latch-bolt unit and latch-handle assembly, using either of the standard backsets, by forming such a longitudinal bore that does not extend substantially beyond such transverse apertures, without any mechanical modification of the mechanism and without any adjustment or modification of such case, unit or assembly.

4,711,478

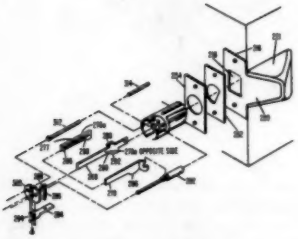
HIGH SECURITY DEADLOCKING DOOR LATCH

Charles Carroll, 2900 Linden La., Falls Church, Va. 22042

Continuation-in-part of Ser. No. 550,745, Nov. 10, 1983, Pat. No. 4,623,175. This application Nov. 14, 1986, Ser. No. 931,416

Int. Cl.[4] E05C *1/16*

U.S. Cl. 292—173 **16 Claims**



1. An assembly including a deadlocking latch which extends one inch out of a door for normal use with standard pre-cut external doors having a transverse opening substantially 2⅛ inches in diameter located substantially 2⅜ inches from the edge of the door, and a hole substantially 15/16 inch in diameter extending from the edge of the door to said transverse opening, comprising:

a longlatch;

means for mounting said longlatch for movement between a fully retracted position and a position where said longlatch extends at least one inch out from the edge of a door;

a striker plate having a flat portion with an opening to receive said longlatch, and an extended depressor means oriented at a substantial angle with respect to said flat portion for moving said longlatch to its retracted position as the door is closed;

spring means mounted within said operating space and extending toward said longlatch from a point substantially beyond the center of the said larger transverse opening and away from the edge of the door, for normally biasing said longlatch to the fully extended position;

said depressor means on said striker plate extending to a distance in the order of one inch away from the plane of said flat portion thereof;

means including a knob or rotatable handle for mounting on at least one side of the door for substantial alignment with the center of the transverse opening for retracting said longlatch the full one inch extension thereof from said striker plate;

plates covering the inside and outside ends of the transverse opening, said plates being held against the door by two security bolts passing through the transverse opening and engaging both plates;

means including (1) a deadlocking plunger mounted adjacent to said longlatch for movement substantially parallel to said longlatch and (2) mechanical linkage means between said deadlocking plunger and said longlatch, to detent the longlatch when the longlatch is in its extended position and the deadlocking plunger is in its retracted position, and to release said longlatch when said deadlocking plunger is in its extended position; and

said assembly having no dimensions which significantly exceed the space provided by the openings in standard pre-cut doors as set forth hereinabove.

4,711,479

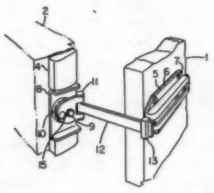
PIVOTING BAR LOCK

Paul M. Grandinetti, 4797 Ellery Dr., Columbus, Ohio 43227

Filed Jan. 29, 1985, Ser. No. 696,118

Int. Cl.[4] E05C *17/20*

U.S. Cl. 292—272 **9 Claims**



1. A door lock for securing a door to a jamb comprising:

(a) a door mount retainer suitable for attachment to said door;

(b) a locking bar; and

(c) a locking guide slidably affixed on said locking bar for locking and applying leverage to close said door against said jamb, said locking bar being adapted to be rotatably affixed at a first end to said jamb of said door and removably affixed at a second end to said door mount retainer, said door mount retainer being adapted to detachably engage said locking bar guide.

4,711,480

LATCH ACTUATING DOOR HANDLES

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Filed Dec. 1, 1986, Ser. No. 936,614

Int. Cl.[4] E05B *3/00*

U.S. Cl. 292—336.3 **10 Claims**

1. A door in combination with actuating handles, comprising:

(a) a bar along and carried by the inside of the door;

(b) a bar along and carried by the outside of the door;

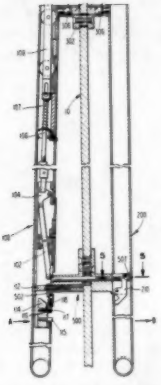
(c) pivot mounting means carried by the door adjacent a perimeter edge thereof and for mounting said bars for limited pivotal movement between positions toward and away from the door;

(d) a latch mechanism longitudinally disposed in said inside bar and terminating in a latch bolt at the end of the bar adjacent said door edge;

(e) a stationary actuator post carried by said door at a loca-

tion spaced from said pivot mounting means and operationally engagable with said latch mechanism for movement of said latch mechanism between latched and unlatched positions in response to movement of either of said bores;

(f) a toggle member disposed within said outside bar and connected to said actuator post for pivotal movement in response to movement of said outside bar away from said door, and wherein said toggle member is operatively



coupled to said latch mechanism to move said latch mechanism to an unlatched position in response to the movement of said toggle member;

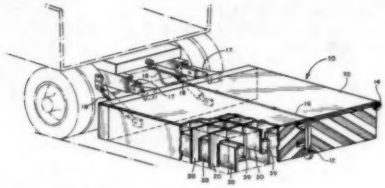
(g) means for operatively securing said inside bar and actuator post relative to each other with said inside bar in a position toward said door, whereby said inside and outside bars are affixed in a non-movable position and wherein said latch mechanism is maintained in an unlatched position.

4,711,481

VEHICLE IMPACT ATTENUATING DEVICE

William G. Krage, Fair Oaks; Barry D. Stephens, Citrus Heights, and Owen S. Denman, Roseville, all of Calif., assignors to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Oct. 25, 1985, Ser. No. 791,298
Int. Cl.[4] B60R *19/34*
U.S. Cl. 293—133 **26 Claims**



1. An energy absorbing device adapted to decelerate an impacting vehicle, said device comprising:

a first diaphragm;

a second diaphragm, spaced from the first diaphragm along an axial direction;

at least one pair of spaced apart, collapsible columns, each aligned with the axial direction and interposed between the first and second diaphragms such that forces applied to the first diaphragm during deceleration of an impacting vehicle cause the columns to buckle; and

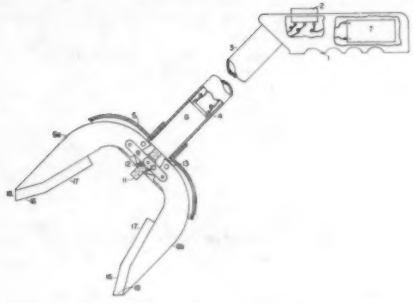
means for bracing the columns diagonally with respect to the axial direction to stabilize the columns against long column buckling and to promote short column buckling of the columns, thereby enhancing energy adsorption efficiency of the device.

4,711,482

REACHING AID FOR THE HANDICAPPED

Larry D. Brown, and Kevin D. Brown, both of Sayre, Pa., assignors to N/C Industries, Sayre, Pa.

Filed Feb. 24, 1987, Ser. No. 17,994
Int. Cl.[4] B25J *1/04*
U.S. Cl. 294—19.1 **7 Claims**



1. A reaching aid for the handicapped, comprising:

a. a hollow body having two ends and a length therebetween at least sufficient for a seated person holding the body to reach the floor without bending;

b. a handle located on one end of the body;

c. gripper means for holding objects, located on the opposite end of the body from the handle, comprising:

1. pivot block means attached to the end of the body;

2. two jaw means each having a pivot end and a gripping end and an arm therebetween;

3. the jaw means being pivotally attached to the pivot block means at the pivot end, whereby the jaw means as a pair may pivot on the pivot block means from a closed position wherein the gripping ends of the jaw means touch to an open position wherein the gripping ends are separated;

4. toggle means for driving the jaw means between the open and closed positions, comprising two toggle links each having two ends and a length therebetween, each toggle link being pivotally attached to a jaw means at one end, the point of attachment being on the arm of the jaw means near the pivot end, and being pivotally attached to the other toggle link at the other end;

5. the lengths of the toggle links being chosen such that when the lengths of the toggle links are aligned with each other the jaw means are in the open position, and when the ends of the toggle links which are attached to each other are drawn toward the pivot block means the jaw means are drawn into the closed position;

6. threaded block means pivotally attached to the two toggle links at the end of the links where they are attached to each other, having a central bore adapted to receiving a rotating motor shaft;

d. electric motor means having a driven rotating shaft output and an electrical input, whereby electrical power applied to the electrical input will cause the shaft to rotate in a selected direction, the motor means being located in the end of the body next to the pivot block means, with the shaft penetrating the pivot block means between the points of attachment of the jaw means;

e. the shaft of the motor means being threaded, and of sufficient length, diameter, and threading to operatively engage the threaded block means, whereby rotating the shaft

acts to draw the threaded block means toward or away from the pivot block means;

f. battery means for activating the electrical input of the motor means;

g. control means for connecting the battery means to the electrical input of the motor means whereby the motor means may be activated in a selected direction by the user, closing or opening the jaw means.

4,711,483

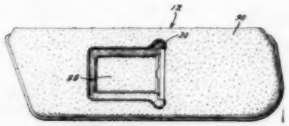
MOTOR VEHICLE VISOR WITH REMOVABLE MIRROR ASSEMBLY

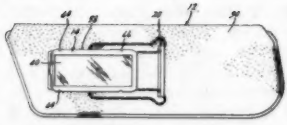
Ronald S. Gulette, Farmington Hills, and Grace M. Charen, Oxford, both of Mich., assignors to Irvin Industries, Inc., Rochester Hills, Mich.

Filed Jan. 21, 1986, Ser. No. 820,078

Int. Cl.[4] B60J *3/00*

U.S. Cl. 296—97 C **8 Claims**





1. A motor vehicle visor assembly comprising:

an internal mirror housing defined by said visor assembly and a mirror guide defining a slot communicating with said internal mirror housing,

a mirror coupled for movement in said internal mirror housing,

said mirror movable to a first position wherein said mirror is coupled with said internal mirror housing and is stowed and enclosed by said visor assembly,

a mirror retainer adjacent said slot, said retainer forming a guide for said mirror and including detent clip means acting upon said mirror for enabling said mirror to be retained by and released from said detent clip means,

said mirror movable to a second position wherein said mirror is withdrawn from said visor assembly exposing said mirror and said mirror retained by said detent clip means, and

said mirror movable to a third position wherein said mirror is detached from said detent clip means and is disconnected from said visor assembly.

4,711,484

TARP COVER SYSTEM FOR FLAT BED VEHICLES

James R. Tuerk, 5231 N. Delaware St., Indianapolis, Ind. 46220

Filed Feb. 19, 1987, Ser. No. 16,768

Int. Cl.[4] B62D *25/06*

U.S. Cl. 296—105 **14 Claims**

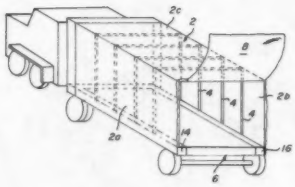
1. A tarp system for covering a load arranged on a flat bed vehicle, comprising:

(a) a pair of longitudinal guide tracks adapted for mounting adjacent the opposite sides of the vehicle flat bed;

(b) a plurality of longitudinally arranged inverted U-shaped bow members each having a first generally horizontal portion extending transversely in spaced relation above the vehicle flat bed, and a pair of downwardly depending vertical leg portions the lower ends of which terminate adjacent said guide tracks, respectively;

(c) a plurality of carrier means connecting the lower ends of said bow leg portions for sliding movement relative to the associated guide track, respectively, said bow members normally having an expanded vehicle-covered condition relative to each other in which said bow members are spaced longitudinally of the flat bed vehicle;

(d) a sheet-like flexible tarp cover member supported by said bow members to enclose at least a portion of the space



above the flat bed vehicle when said bow members are in said expanded vehicle-covered condition, said tarp member having a top portion supported by said bow horizontal portions, a pair of side portions extending downwardly adjacent the external surfaces of said bow leg portions, respectively, and a pair of horizontal bottom flap portions that extend inwardly from the lower ends of said side portions beneath said carrier means and said guide rails, respectively; and

(e) means for relatively displacing said bow members between said expanded condition and a collapsed vehicle-uncovered condition in which said bow members are adjacent each other and said tarp member is collapsed to uncover said flat bed portion.

4,711,485

OPEN TOP TYPE AUTOMOBILE BODY STRUCTURE

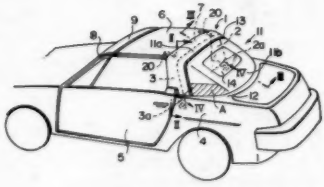
Jiro Maebayashi, and Masaya Hamamoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 18, 1985, Ser. No. 788,955

Claims priority, application Japan, Oct. 19, 1984, 59-220256; Dec. 3, 1984, 59-183458[U]

Int. Cl.[4] B60J *7/12, 7/14, 7/19*; E05D *3/06*

U.S. Cl. 296—108 **38 Claims**



1. An open top automobile body including a body structure having a front windshield section, opposite side panels and a rear section, a hoop member of a substantially inverted U-shape having a pair of leg portions swingably mounted respectively on the opposite side panels for movement between an erected position wherein the hoop member extends substantially upright and a retracted position wherein the hoop member is retracted in the rear section, a rigid roof panel adapted to be placed between the front windshield section and the hoop

member in the erected position, said roof panel having a rear edge portion connected through hinge means to said hoop member, foldable hood means between said rear section and the hoop member in the erected position, said hood means having a front edge portion attached to the hoop member and a rear edge portion attached to the rear section, said rear section of the body being provided with a space for receiving said roof panel, said hoop member and said hood means when they are retracted, said hinge means including a first link having one end connected with said hoop member and a second link having one end connected to said roof panel, a further portion of said secod link being pivotably connected with the other end of the first link, locking means for preventing a relative rotation of the first and second links when the hoop member is in the erected position and said roof panel is placed between the front windshield and the hoop member.

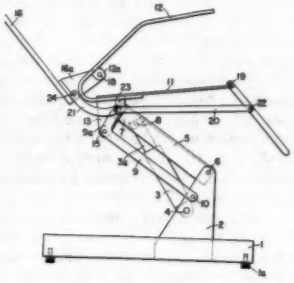
4,711,486
BARBER AND BEAUTY PARLOR CHAIR

Kunio Fujiyama, New York, N.Y., assignor to Takara Company, Somerset, N.J.

Continuation of Ser. No. 755,962, Jul. 17, 1985, abandoned, which is a continuation of Ser. No. 443,564, Nov. 27, 1982, abandoned. This application Dec. 8, 1986, Ser. No. 939,223

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—71 **2 Claims**



1. A beauty parlor or barber shop chair, said chair having pivoted frame members manipulatable by an integral hydraulic cylinder, so that the chair is adjustable from an upright position into a reclined and substantially horizontal position, whereby back-shampooing of the head of a person sitting in the chair may be accomplished with comfort, which comprises:

(a) a generally horizontal base member,

(b) a substantially vertical supporting plate, said supporting plate being mounted to and extending upwards from said base member,

(c) a hydraulic cylinder, said hydraulic cylinder having an upper plunger and being pivotally mounted to the middle region of said supporting plate,

(d) a main link arm, one end of said main link arm being pivotally mounted to the upper end of said supporting plate, a middle region of said main link arm being pivotally mounted to the outer upper end of said plunger,

(e) a rising bracket, said rising bracket being pivotally linked to the other end of said main link arm,

(f) a sub link, said sub link being elbow-shaped, one end of said sub link being pivotally mounted to said supporting plate, the apex of said sub link being pivotally mounted to said rising bracket,

(g) a foot rest plate, said foot rest plate being juxtaposed with said supporting plate,

(h) a transverse connecting arm, said transverse connecting arm extending between a pivoted mounting at one end to said foot rest plate, and a pivoted mounting at the other end to the other end of said sub link,

(i) a seat plate, said seat plate being adapted to receive the weight of the torso of said person and being disposed adjacent and above said transverse connecting arm, one end of said seat plate being pivotally mounted to the upper end of said foot rest plate, the other end of said seat plate being mounted to said rising bracket,

(j) a curved connecting arm, one end of said curved connecting arm being pivotally mounted to both the other end of said sub link and the other end of said transverse connecting arm at a unitary pivoted linkage,

(k) a back plate, said back plate being adapted to receive and support the back region of said person,

(l) ε connecting bracket, said connecting bracket extending laterally from the lower end of said back plate, the other end of said curved connecting arm being pivotally attached to said connecting bracket, and

(m) an arm rest plate, said arm rest plate extending from a middle pivoted attachment to said connecting bracket, the other end of said arm rest plate being attached to said seat plate, so that, when said pivoted frame members are pivoted by activation of the upper plunger of said hydraulic cylinder, said foot rest plate is pivotally raised, said seat plate is raised, and said back plate is reclined, said chair being thereby adjusted from an upright position into a reclined and substantially horizontal position where the movements of the chair resemble the movements of a human body, whereby shampooing of the back of the head of a person sitting in said chair may be accomplished.

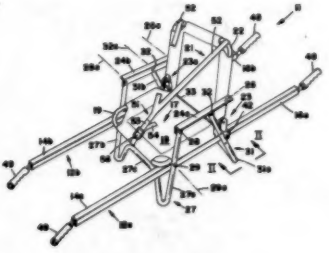
4,711,487
EVACUATION CHAIR

Royce L. Brooks, Benicia, Calif., assignor to Norman D. Koerner, Benicia, Calif.

Continuation of Ser. No. 349,913, Feb. 18, 1982, abandoned. This application Jul. 2, 1985, Ser. No. 750,993

Int. Cl.[4] A61G *1/00*

U.S. Cl. 297—183 **1 Claim**



1. Apparatus for manually transporting persons, comprising:

a pair of spaced apart parallel linear carrier arms each having opposite end portions and a central portion situated therebetween, all of said portions of said carrier arms being coplanar,

wherein each of said pair of spaced apart parallel carrier arms has a telescopic construction in which a first of said end portions of the carrier arm is slidable into said central portion of the carrier arm to a storage position and is extendable therefrom to an operating position, and in which the other of said end portions of said carrier arm is of lesser diameter than said first carrier arm end portion, said other carrier arm end portion being slidable into both said central portion of said carrier arm and said first carrier arm end portion and being extendable therefrom to an operating position, further including detent means for latching said slidable carrier arm end portions at said extended operating positions,

a seat member extending between said carrier arms at said central portions thereof and being secured thereto, said seat member being substantially coplanar with said carrier arms and being spaced apart from the ends thereof suffi-

ciently to enable a first carrier person to stand between said arms in front of said seat member and to enable a second carrier person to stand between said arms behind said seat member,

a back support and first pivot means for connecting said back support to said seat member and carrier arms while enabling pivoting of said back support between a storage configuration at which said back support is folded over said seat member in parallel relationship thereto at said central portions of said carrier arms and an operating position at which said back support extends upwardly therefrom,

a plurality of leg memers which extend both above and below said seat member at said central portions of said carrier arms and second pivot means for inter-connecting said leg members and said seat member and carrier arms while enabling pivoting of said leg members between a storage configuration at which said leg members are substantially parallel to said seat member at said central portions of said carrier arms and an operating position at which said leg members extend upwardly and downwardly therefrom, and

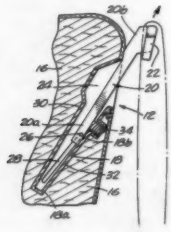
linkage means for enabling joint pivoting of said back support and said leg members between said storage positions thereof and said operating positions thereof, said linkage means including a pair of arm rests such of which extends between said leg members at an opposite side of said seat member and at a location above said seat member to form a pivotable connection between said leg members at each side of said apparatus.

4,711,488

GARMENT HANGER

Stephen Ohanessian, 734 W. Hyacianth, West Covina, Calif. 91791

Filed Aug. 22, 1986, Ser. No. 899,233
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—190 **4 Claims**



1. An upholstered chair comprising:

(a) a seat portion;

(b) a back portion connected to said seat portion, said back portion being provided with an internal chamber having spaced apart front and back walls;

(c) a first member having first and second ends, said first member being disposed within said internal chamber, said first end thereof being connected to said back portion;

(d) second member having first and second ends said second member being slidably interconnected with said first member for sliding movement between a first retracted position wherein said second member is fully disposed within said internal chamber and a second extended position wherein said second end of said second member extends rearwardly of said back; and

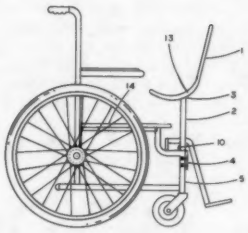
(e) garment hanging means carried proximate said second end of said second member.

4,711,489

CHILD SEAT ASSEMBLY FOR WHEELCHAIR

Hugh A. Krause, R.R. 6 Box 190 188, Bemidji, Minn. 56601

Filed Feb. 7, 1986, Ser. No. 827,385
Int. Cl.[4] A47C *15/00*
U.S. Cl. 297—243 **5 Claims**



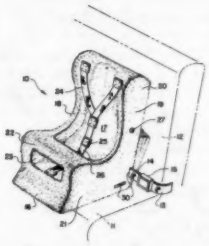
1. A child seat assembly for mounting on and removal from a wheelchair frame having vertical front struts, located in front of a wheelchair occupant facing toward or away from said occupant, having first and second framework in an L-shaped configuration permanently mounted on first and second support means which are attached perpendicularly downward from horizontal legs of said framework, and having a cloth panel with fastening means secured around and suspended between said framework, with child seat assembly occupant restraint means affixed to said panel rearwardly and secured forwardly, said support means insert into and extract from first and second receiving means with stopping means affixed to said support means to halt said support means at an optimum height above said wheelchair occupant, and which said receiving means attach to said wheelchair front vertical struts using first and second adaptor means in such a manner that said receiving means and said adaptor means lie parallel with said wheelchair struts and are held in place with securement means, said framework, support means, and receiving means being made of a strong, lightweight nonferrous metal characterized by aluminum, magnesium or graphite to minimize adding undesired weight to said wheelchair, said cloth panel being of a heavy, breathable fabric to ensure durability, and said adaptor means being of a non-metal substance characterized by wood, plastic or nylon to prevent marring of said wheelchair frame, said securement means comprising at least first and second clamps for each said receiving means to dependably attach said receiving means and said adaptor means to said wheelchair frame.

4,711,490

INFLATABLE INFANT SEAT

Harold E. Brand, 11039 Fenway, Sun Valley, Calif. 91352

Filed Oct. 23, 1986, Ser. No. 922,251
Int. Cl.[4] A47C *1/08*
U.S. Cl. 297—250 **3 Claims**



1. In an inflatable, portable infant or child seat arrangement

for supporting a seated occupant in either an upright or a reclined position and being adapted to receive a standard seat belt for holding the seated occupant in either positioning, the combination comprising:

a pliable fabric material arranged in a unitary construction to provide a seat, a back, opposite sides and a frontal bar connecting said opposite sides;

said unitary seat construction defining internal pressurized air compartments establishing said seat in an expanded or inflated condition to support the occupant;

means provided on said seat construction for inflating thereof and deflation thereof between a first operational expanded condition and a second deflated storage condition;

slot means on said unitary seat construction cooperating with said standard seat belt securement arrangement for releasably retaining said seat construction on a conventional auto seat in either of its upright or reclined positions;

an inflatable pouch separate from said internal pressurized air compartments carried on the exterior of said back for maintaining said unitary seat construction including the occupant in a prone third position; and

back straps carried on said seat back for supporting said unitary seat construction from the shoulders of a person carrying said seat construction and the occupant thereof.

4,711,491

SWIVEL TILT MECHANISM FOR CHAIR

Jonathan Ginat, 26 W. 9th St., New York, N.Y. 10011

Filed Jun. 9, 1986, Ser. No. 872,192

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—301 **5 Claims**

1. A chair comprising:

a base;

a member mounted on said base;

a seat support pivotably attached to said member;

spring means for urging said seat support towards a rest position with respect to said member; and

tilting means for changing said rest position, wherein said tilting means comprises a flat member with variable thickness disposed between said member and said seat support, said flat member being shiftable to change the distance between said member and said seat support.

4,711,492

CHAIR BACK ARRANGEMENT

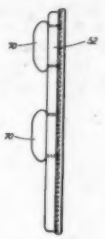
Svein Asbjornsen, and Jan Lade, both of N-6230 Sykkylven, Norway

Continuation-in-part of Ser. No. 787,362, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 576,780, Feb. 3, 1984, abandoned, which is a continuation of Ser. No. 339,459, Feb. 22, 1981, abandoned. This application May 19, 1986, Ser. No. 866,994

Claims priority, application Norway, May 6, 1980, 801328

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—284 **14 Claims**



1. A seating furniture back arrangement comprising a back portion having at least one receiving means attached to said back portion, said receiving means extending along said back portion in the direction substantially parallel to a longitudinal axis of the back portion,

support pillow means having engaging means, at least a portion of said engaging means protruded from one side of said support pillow means, said engaging means is adjustably receivable by said receiving means in an assembled condition of the arrangement,

said engaging means having an engaging part for engagement with said receiving means and a connecting part for connection of said engaging part to said support pillow means,

said receiving means is an elongated member having a substantially C-shaped crossection with a front wall having an opening, a rear wall and at least two side walls connecting said front and rear walls,

said engaging means having an engaging part for engagement with said receiving means and an elastic connecting part connecting said engaging part with said support pillow means,

said engaging means and said support pillow means are retained in a predetermined position by means of inherent resilient and frictional forces of said engaging and receiving means and inherent mutual forces existing between said support pillow means and said back portion.

4,711,493

MOUNTING OR LOCKING ASSEMBLY, ESPECIALLY FOR USE WITH PIVOTABLE MOTOR VEHICLE SEATS

Ralf-H. Schrom, Rüsselsheim, and Horst Baltes, Florsheim, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1986, Ser. No. 831,179

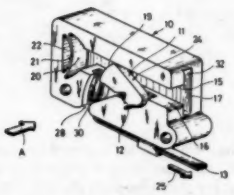
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513807

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—379 **2 Claims**

1. In an automotive vehicle having a seat back rest pivotally supported by vehicle body structure for movement to and from an upright position, a locking element carried by one of said back rest and body structure of the vehicle and a locking device carried by the other of said back rest and body structure of the vehicle, said locking device comprising a housing having a guide slot means for receiving said locking element when

the seat back is moved to its upright position, a pivotal latch member carried by said housing means and which is spring biased toward a first position in which it is disposed within the guide slot means, said latch member being movable in opposition to its spring biasing force toward a second release position to enable said locking element to clear the latch member when the back rest approaches its upright position and then returned by the spring biasing force toward its first position to lock the locking element to the housing means, and a releasable means operatively associated with said latch member to enable the latter to be moved from its first position toward its second position in opposition to the spring biasing force to enable the locking element to clear the latch member and said seat back to be unlocked and moved from its upright position, the improvement being that said locking device is of a one piece molded plastic construction, that the latch member adjacent one end thereof is integral with the housing via a web hinge which functions both as a pivot for the latch member and as a spring for biasing the latch member toward its first position, the latch



member at its other end is free from the housing, has an end surface for engaging the locking member and has a side surface which is disposed within the guide slot means when in its first position and defines a side surface of the guide slot means when moved to its second release position, that the releasable means includes an actuating element extending through a slot in the housing and which is integral at one end to the other end of said latch member to enable said latch member to be moved from its first position to its second release position by pulling on said actuating element whereby the locking element can be removed from or received within the guide slot means of said housing, said latch member at said one end adjacent the web hinge having a convex surface which is shaped complementary with an adjacent concave surface in said housing such that forces applied by the locking element to the latch member in a reverse unlocking direction are transmitted directly to said housing, and said housing at the end of said guide slot means having an integrally formed convex leaf spring for resiliently engaging said locking element and holding the latter against said latch member.

4,711,494

FOLDABLE HEADREST FOR VEHICLE REAR SEAT

Manfred Duvenkamp, Trebur-Geinsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 939,176

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1986, 3605774

Int. Cl.[4] A47C *1/10*

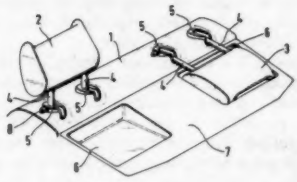
U.S. Cl. 297—403 **8 Claims**

1. A foldable headrest arrangement for the backrest of a vehicle seat:

a rod supporting the headrest and having an upper rod portion connected to the rod by an unlockable pivot joint to permit the head rest and upper rod portion to be folded down,

a sleeve-like guide means provided at the upper portion of the seat backrest and receiving the rod,

a lift mechanism provided in the backrest including a preloaded spring contained within the sleeve-like guide means to permit manual slidable insertion of the rod into the sleeve-like guide means to lock the unlockable pivot joint and activate the lift mechanism, said spring acting to raise the rod to a position in which the pivot joint is unlocked,



a latching device adapted to retain the rod in the position of insertion within the sleeve-like guide means,

and a solenoid adapted to unlatch the latching device and being controlled by a circuit arranged in the vehicle.

4,711,495

UPHOLSTERED FURNITURE

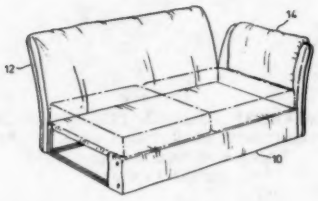
Max Magder, Milton, Canada, assignor to DuBarry Furniture of Canada Limited, Toronto, Canada

Continuation of Ser. No. 685,928, Dec. 24, 1984. This application Oct. 17, 1986, Ser. No. 920,909

Claims priority, application Canada, Dec. 14, 1984, 470175

Int. Cl.[4] A47C *7/00*

U.S. Cl. 297—440 **3 Claims**



1. Knock down seating furniture having:

a base for supporting at least one seat cushion,

a back element for supporting at least one back cushion, at least one end element,

threaded fastening means for removably securing said back element and said end element to said base,

said base comprising,

a plurality of tubular metallic members affixed to one another and defining the perimeter of a substantially rectangular prism said prism having members forming an upper seating plane and members forming a lower plane,

a plurality of spring wires extending between two of said tubular members in said upper seating plane to comprise a seat cushion supporting plane,

a sheet of resilient synthetic foamed cushioning material affixed to at least one of said tubular members and overlying said upper seating plane,

and upholstery fabric overlying at least said upper seating plane and said cushioning material,

said upholstery fabric having at least one front panel depending from said upper seating plane,

said front panel extending from said upper seating plane down to and around at least one of said tubular members in said lower plane and upwardly such that the panel terminates at an edge thereof which is near the said spring wires,

and a plurality of staple fasteners fastening the said panel and its said edge to said spring wires,

wherein said panel has at least one pocket along said panel

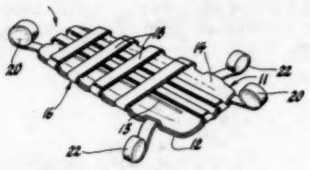
edge and said staple fasteners engage said pocket, and wherein said fabric comprises a plurality of side and back depending panels each panel having a panel edge, each panel extending around at least one of said tubular metallic members, each panel having a pocket extending along said panel edge, reinforcing means within said pockets and staple fastening means encompassing said reinforcing means and a portion of said spring wires thereby fastening said fabric to said base.

4,711,496

VEHICLE SEAT CONSTRUCTION

Michael W. Lathers, Metamora, and Richard P. Bruning, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1986, Ser. No. 888,714
Int. Cl.[4] A74C *5/00, 7/00*; B60R *22/12*
U.S. Cl. 297—452 **3 Claims**



1. A motor vehicle seat construction, said construction in combination comprising:

a hardened pan shaped back plate assembly including inner and outer shells; and

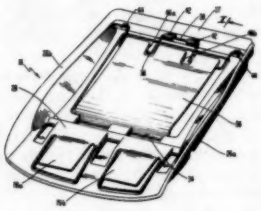
a flexible sheet of material with legs projecting outwardly therefrom, the sheet being captured between said back inner and outer shells with said projecting legs bridging over said back plate assembly opposite said back outer shell to provide a cushion for a said seat, and whereby said projecting legs also provide a belt restraint for said seat.

4,711,497

SEAT FOR VEHICLES

Kenichi Kazaoka, Nagoya; Fumio Wakamatsu, Okazaki, and Yasuo Shinkai, Nagoya, all of Japan, assignors to Aisin Seiki Kabushika Kaisha, Japan

Filed Jun. 17, 1985, Ser. No. 745,421
Claims priority, application Japan, Jun. 18, 1984, 59-126220; Jun. 20, 1984, 59-128303; Jun. 20, 1984, 59-128304
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—458 **10 Claims**



1. A seat for mounting on a vehicle floor comprising:

a molded plastic seat frame having a substantially rectangular base member and including sidewalls and a rear wall extending upward from said base member for retaining a seat cushion therebetween, said seat frame having a ledge extending along said base member between said sidewalls and dividing a front portion of said frame from a rear portion, said base member having a support surface extending forward of said ledge for supporting a forward portion of said seat cushion, said support surface defining a planar surface and including at least one cut-out section having a substantially U-shaped configuration extending upward at an angle away from said planar surface for providing flexible support for said seat cushion, said base member also having an open section and a plate member extending rearward from said ledge within said open section, said plate member being pivotally positioned about said ledge and supporting a rearward portion of said seat cushion independent of said forward portion of said seat cushion, said rear portion having a ridge member between said sidewalls along said rear wall;

spring means connected to said ridge member and extending within said open section for flexibly supporting a rearward portion of said seat cushion positioned on said plate member, said plate member including means for holding said spring means in engagement with said plate member;

front and rear connecting rods for firmly supporting said seat frame, said front connecting rod being aligned substantially adjacent said ledge and said rear connecting rod extending substantially adjacent said ridge member; and

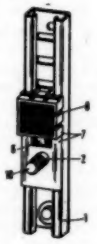
a backrest connected to said seat frame and supporting a backrest cushion.

4,711,498

HEIGHT ADJUSTING ARRANGEMENT FOR A GUIDE FITMENT OF A SAFETY BELT

Heinz-Dieter Adomeit, Grolmanstr. 16, D-1000 Berlin 12, Fed. Rep. of Germany

Filed Dec. 26, 1985, Ser. No. 813,741
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1984, 3447817
Int. Cl.[4] B60R *21/10*
U.S. Cl. 297—468 **8 Claims**



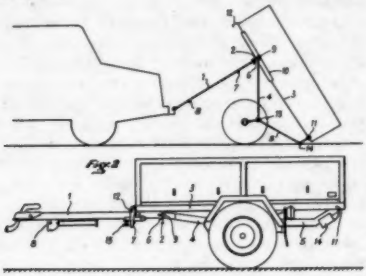
1. A height adjusting arrangement for a guide fitment which is preferably disposed on the door post of a motor vehicle for safety belts, comprising a stationary guide rail (1) of double-C-shaped configuration, a slide (2) which is slidable along the guide rail and to which the guide fitment can be mounted, and a blocking element (5) which latches the slide (2) to the guide rail (1 and extends through an opening (11) in the slide (2), characterised in that a row of arresting teeth (9, 9') is formed longitudinally of the web portion (20) which connects the C-shaped portions of the guide rail (1) against which one end (21) of the blocking element (5) disposed substantially within the guide rail (1) can be engaged, and which at the other end (22) can be brought into enagement with a lock button (8), and that the slide (2) is of substantially U-shaped cross-section, wherein the free limbs of the U-shape are guided in the respective C-shaped portion of the guide rail (1).

4,711,499

TIPPER TRAILER

Jean-Louis Fortin, 9, rue Picard, 52410 Eurville-Bienville, France

Filed May 24, 1985, Ser. No. 737,423
Int. Cl.[4] B60P *1/04*
U.S. Cl. 298—5 **8 Claims**



1. A tipper trailer comprising:

a bed plate having a front and a rear;

a wheel-supporting frame including two ground-engaging wheels defining a horizontal transverse wheel axis, said frame being hinged to said bed plate proximate the rear end of said bed plate about a first hinge axis parallel to said wheel axis;

a longitudinally directed slide disposed under said bed plate and rigidly connected thereto slidingly receivable of a sliding hinge;

a sliding hinge received within said longitudinally directed slide, said sliding hinge slideable between a forward position proximate said front of said bed plate and a rearward position remote from said front of said bed plate;

a tow bar having a front end suitable for coupling to a towing vehicle, and having a rear end directly coupled to said sliding hinge about a second hinge axis parallel to said wheel axis, said tow bar being pivotable about said second hinge axis relative to said bed plate;

releasable locking means for locking said tow bar to said bed plate to prevent said tow bar for rotating relative thereto; and

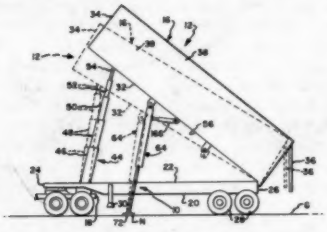
at least one connecting rod having a first end pivotally coupled to said sliding hinge about said second hinge axis and having a second end pivotally coupled to said wheel-supporting frame about a third hinge axis parallel to said wheel axis.

4,711,500

STABILIZING APPARATUS FOR A DUMP VEHICLE

David J. Spanton, 3464 Westlake Rd., Wilson, N.Y. 14172, and Martin Schulze, 2064 Old Coomer Rd., Burt, N.Y. 14028

Filed Nov. 24, 1986, Ser. No. 933,392
Int. Cl.[4] B60P *1/16*
U.S. Cl. 298—17 S **25 Claims**



1. Stabilizing apparatus for a dump vehicle having a frame, an elongated dump box supported by and connected to the frame for pivotal movement relative thereto between a lowered condition in which both ends of the dump box are positioned relatively low in relationship to the frame and an elevated condition in which one end of the dump box is positioned relatively high in relationship to the frame and means for pivoting the dump box relative to the frame between the lowered and elevated conditions, said apparatus comprising:

at least one leg member having two end sections connected to one another for telescopic movement, one of said end sections being connectable to the dump box adjacent one side thereof for pivotal movement relative thereto between a first condition in which the leg member is positioned generally alongside the box for storage and a second condition in which the leg member extends angularly downwardly from the box for engagement of the other end section of the leg member with the ground; and

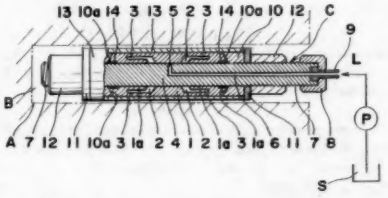
hydraulic means for telescopically moving the end sections of the leg members relatively to one another as the dump box is moved relative to the frame between the lowered and elevated conditions so that said other end section is maintained in engagement with the ground as the dump box is moved as aforesaid so that said leg member braces the dump vehicle against forces which tend to tip the dump vehicle upon one of its sides.

4,711,501

ROCK CRUSHING DEVICE

Akiya Maeda, Tondabayashi; Mituya Sakai, Kashihara; Yukinobu Masaka; Masahiro Nomura, both of Ichinomiya; Yasuo Yamada, Seki, and Tetsuro Tatsuhama, Osaka, all of Japan, assignors to Okumura Machinery Corporation, Osaka and Seibu Polymer Kasei Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 26, 1985, Ser. No. 759,361
Claims priority, application Japan, Jul. 30, 1984, 59-117790[U]; Jul. 30, 1984, 59-117791[U]
Int. Cl.[4] F21C *37/10*
U.S. Cl. 299—21 **22 Claims**



1. A device for crushing a rock by inserting said device into a borehole formed in said rock, comprising:

a cylindrically shaped expandable elastic member having cavities formed therein;

a shaft partially encompassed by said elastic member and having a fluid passage formed therein, one end of said fluid passage being connected to a pressure fluid source and the other end thereof communicating with said elastic member for permitting expansion of said expandable member by conveyance of fluid from said source to said cavities so as to crush said rock;

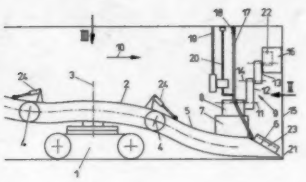
fixtures mounted on said shaft at end portions thereof for preventing said elastic member from expanding along an axial direction of said shaft upon conveyance of said fluid; and

metal rings separate from said shaft, and embedded at respective end portions of said elastic member for preventing said elastic member from warping at said end portions upon conveyance of said fluid.

4,711,502
APPARATUS FOR CUTTING EXCAVATIONS HAVING A SUBSTANTIALLY PLANAR FACE

Franz Bärnthaler, Weisskirchen; Ferdinand Bedenk, Zeltweg; Otto Schetina, Zeltweg, and Alfred Zitz, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 12, 1985, Ser. No. 754,214
Claims priority, application Austria, Jul. 16, 1984, 2300/84
Int. Cl.[4] E21C *27/18;* E21P *23/03*
U.S. Cl. 299—33 4 Claims



1. Apparatus for cutting excavations having a substantially planar face (15), comprising a cutting tool (16), which is rotatably mounted on the jib (9), which is pivoted to a mobile machine, characterized in that the jib (9) is mounted for a pivotal movement in a plane which is transverse to the heading direction (10), the jib (9) is divided into at least two jib sections (12, 13), which are pivotally movable relative to each other about an axis (14) which is substantially parallel to a pivotal axis (11) of the jib (9), said jib being pivotable about said pivoted axis (11) and the cutting tool (16) is rotatably mounted close to or at the free end of that jib section (13) which is most remote from the pivotal axis (11) of the jib (9),

characterized further in that the jib (9) is pivotally movable about the pivotal axis (11), which is parallel to the heading direction (10),

characterized still further in that the cutting tool (16) includes a cutter drum or cutter head, which is mounted for rotation about an axis that is parallel to the pivotal axis (11) of the jib (9),

characterized in that at least one of the jib sections (12, 13), preferably the outermost jib section (13), is adapted to be angled in itself at an end portion (13A) about an axis (27) which is perpendicular to but spaced from the axis (14) on which said outermost jib section (13) is pivoted, said preceding jib section (12) being pivotable on the pivotal axis (11), said jib (9) being provided on a turning drive (8),

further comprising a loader (6) and conveyor (2, 5) and further characterized in that the turning drive (8) for the jib (9) is mounted or supported on a bracket (7), which is supported by the mobile machine on a part of the conveyor (2, 5), which part is supported on the floor and the drive means (22) for rotating the cutting tool (16) are mounted on the outermost jib section (13) and preferably at least in part inside cutting tool (16), said cutting tool being hollow,

characterized in that at least one roofhole drilling and bolt setting device (19) is supported on the bracket (7) which carries the jib (9),

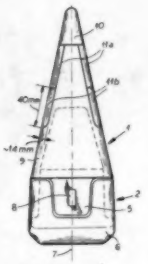
characterized in that a dust-tight shield or wall (17) succeeding the jib (9) in the heading direction (10) is supported on the bracket (7) and has external edges (18) with flexible means for sealing the working face (15), and

characterized in that the loader (6) is disposed under the jib (9) and includes a loading ramp (6) which extends transversely to the heading direction.

4,711,503
REPLACEABLE TOOTH FOR A DIGGING AND BREAKING TOOL

Rütger Berchem, Gelsenkirchen, and Georg Prokscha, Recklinghausen, both of Fed. Rep. of Germany, assignors to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 901,269
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531787
Int. Cl.[4] E21C *35/18;* E02F *9/28;* A01B *23/02*
U.S. Cl. 299—79 5 Claims



4. A replaceable tooth article for a digging and breaking tool used in a suction head of an excavator consisting of an adapter and a replaceable tooth positioned over said adapter comprising:

a core composed of low alloy, temperable and hardenable steel having a truncated pyramidal outer shape and a plurality of rounded edges;

a rounded tooth peak of hard metal mounted on said core and having a central stud protruding from a base of said peak engaging in a recess in said core, said peak having a pyramidal shape modified with a rounded apex, the outer shape of said tooth being such that said edges of said core extend from said tooth peak and are at least partially bevelled; and

a plurality of edge elements for each edge composed of hard metal placed on the bevelled surfaces formed therein and said core, said tooth peak and said edge elements of said hard metal are joined together in a smooth surface.

4,711,504
ROTATING CUTTER HEAD

Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 901,287
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531384
Int. Cl.[4] E21C *35/18*
U.S. Cl. 299—86 5 Claims

1. A rotating cutter head which can be moved against a surface that is to be worked on an excavating machine, said head comprising:

a rotatable support comprising a base ring and a plurality of helically disposed arms mounted on said ring;

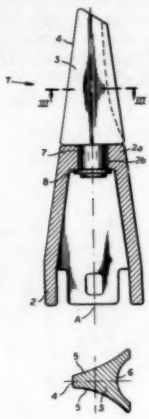
a multiplicity of tool units positioned on said helically disposed arms of said support, each of said tool units comprising:

a respective mounting base secured to said arms,

a respective tool member having at least one cutting edge for each said base, said tool member having a wedge-shaped cross section defining with flanking surfaces on either side of an apex of said cutting edge, said surfaces being curved in a concave manner, and

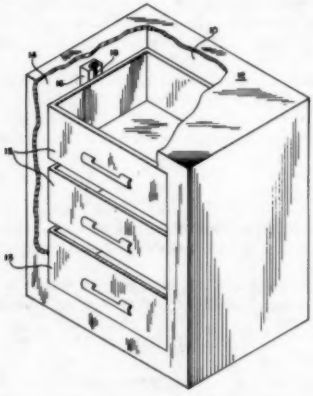
means for operatively connecting each tool member to the respective mounting base such that the tool member can carry out swiveling movement about a respective axis

of rotation, said axis being inclined with respect to an axis of rotation of said support, said swiveling move-



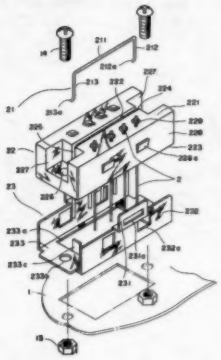
ment being in response to an alignment of the respective edge caused by a cutting force or reaction force in an excavating attack position.

4,711,505
LOCKING SYSTEM
Matthew L. Lakso, 19 Bacon St., Westminster, Mass. 01473
Filed Feb. 6, 1987, Ser. No. 11,888
Int. Cl.[4] E05C *7/06*
U.S. Cl. 312—220 **19 Claims**



1. An interlocking system comprising a string of single, whole discrete elements, receptor means to confine said elements in said string variously in a seperable and movable condition and in a contiguous and immovable position along said string, a series of at least two actuators at selectably fixed positions along said string, each actuator having an interposing means arranged to be entered by movement of said actuator at least partly between two of said elements when at least some of the elements may thus be moved along said string and both said two elements are positioned to allow such entrance of the interposing means of one said actuator operating to prevent entrance between elements of the interposing means of the other one or more actuators against movement.

4,711,506
SOCKET OF ELECTROSTATIC PROTECTION TYPE
Masanori Tanaka, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan
Continuation of Ser. No. 738,333, May 28, 1985, abandoned. This application Jan. 13, 1987, Ser. No. 8,065
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—108 **6 Claims**



1. A socket for protection of circuits and the like from weak currents that will damage the main connection function of said circuits and the like, said socket comprising:

socket body means having a plug connecting surface with a plurality of contact means arranged on both sides of a groove means provided on said plug connecting surface, said socket body means having vertical cut-out means, said socket body means formed of insulating material;

electrically conductive frame means into which said socket body means is tightly fitted, said frame means having metal plate means which is inserted into said vertical cut-out means of said socket body means, said metal plate means being connected to ground; and

ground spring means of elastic metallic material having a back portion to be fitted into said groove means on said plug connecting surface of said socket body means and having legs which are bent at both lengthwise ends of said back portion, said legs being inserted into said vertical cut-out means of said socket body means such that said metal plate means is forcibly inserted between at least one of said legs and a wall of said vertical cut-out means of said socket body means, said at least one of said legs being grounded by being in elastic contact with said metal plate means forming an elastic engaging portion, said ground spring means being outwardly exposed at said back portion when said ground spring means is fitted into said groove means on said plug connecting surface of said socket body means.

4,711,507
ELECTRICAL CONNECTOR AND LATCHING APPARATUS THEREFOR
Peter Noorily, Bridgewater, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.
Continuation-in-part of Ser. No. 785,314, Oct. 7, 1985, abandoned. This application Jul. 17, 1986, Ser. No. 887,664
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—292 **32 Claims**

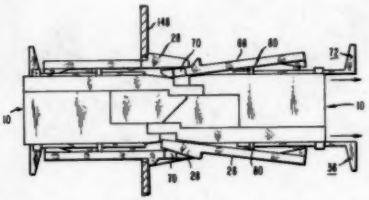
1. An electrical connector for cooperative engagement with a latching portion of an electrical component, comprising:

a plurality of electrical contacts;

a housing supporting said electrical contacts, said housing having a mating end for engagement with said electrical component and an opposing end;

a movable arm integrally supported on said housing, said arm having a latch facing said mating end of said housing and a cam surface facing said opposing end of said housing, said arm being pivotally supported on said housing intermediate said latch and said cam surface such that said latch is movable toward and way from said housing; and

a cam actuator supported on said housing and movable from a first position to a second position, said cam actuator including cam means thereon engaging said arm cam



surface when said actuator is in said first position whereby said latch is in a non-locking relation with said latching portion of said electrical component, said actuator including spacer means thereon for pivotally moving said latch relative to said housing mating end during movement of actuator to said second position, said spacer means substantially preventing movement of said latch when said actuator is in said second position to thereby hold said latch in a locking relation wtih said latching portion of said electrical component.

4,711,508

TERMINAL RETAINING STRUCTURE FOR CONNECTOR

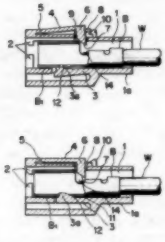
Tadahiro Sueyoshi, Kosai, Japan, assignor to Yazaki Corporation, Japan

Filed Dec. 13, 1985, Ser. No. 809,069

Claims priority, application Japan, Dec. 14, 1984, 59-188819[U]

Int. Cl.[4] H01R *11/00*

U.S. Cl. 439—595 **6 Claims**



1. A terminal retaining connector structure for retaining an electrical terminal contact having a front end terminating in a rear shoulder comprising:

a connector housing having first and second peripheral walls, said first and second walls defining terminal receiving space means, said first wall having an opening means to open into said terminal receiving space means for receiving the front end of the terminal; and

a swingable locking tongue having a forward hinge portion and a rear free end, said tongue formed integrally with said first wall to extend rearwardly from said hinge portion at an angle to said first wall and being pivotal through said angle about the hinge portion towards said first wall so as to be juxtaposed and generally parallel with respect thereto when in a locking position, said swingable tongue having a wedge-shaped hook formed in said free end, said wedge-shaped hook having sloping surface facing forwardly, said wedge-shaped hook adapted to be inserted through said opening into said terminal receiving space means when said swingable locking tongue is bent flat over the first wall into the locking position wherein the sloping surface engages the rear shoulder so that the terminal is pushed forwardly into the connector housing by the sloping surface exerting a forwardly directed force on the rear shoulder as the tongue is bent to locking position.

4,711,509

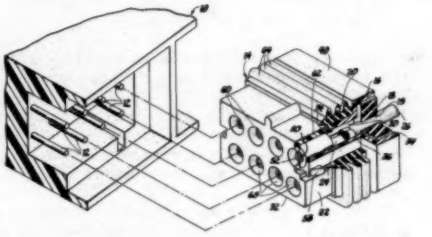
ELECTRICAL CONNECTOR

William E. Cross, Brookfield; Jeanne E. Hillestad, Niles, and Robert G. Plyler, Vienna, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1985, Ser. No. 804,934

Int. Cl.[4] H01R *11/00*

U.S. Cl. 439—587 **10 Claims**



1. An electrical connector comprising:

a connector body having a terminal cavity extending axially through the connector body from a forward contact end to a rearward conductor end,

said connector body having a nose portion at the forward contact end which comprises a plurality of ribs defining a channel at the forward portion of the terminal cavity,

said connector body further having a lock shoulder in the terminal cavity which faces the forward contact end of the connector body,

an elastomeric ring mounted on the connector body so that a portion of the elastomeric ring extends across the channel at the forward portion of the terminal cavity for biasing a portion of a terminal inserted into the terminal cavity to an interference position with respect to the lock shoulder so as to retain the terminal in the rearward direction, and

a cap member mounted on the nose portion of the connector body to retain the terminal in the terminal cavity in the forward direction.

4,711,510

ELECTRICAL CONNECTOR FOR TRACTOR-TRAILER RIG

Alfred J. Orlando, Jr., 32 Carl Rd., Walpole, Mass. 02081

Filed May 15, 1986, Ser. No. 863,924

Int. Cl.[4] H01R *13/625*

U.S. Cl. 439—246 **7 Claims**

1. A multiwire electrical connector for making electrical connections, said connector comprising:

a first member with three or more first connector elements, said elements being distribured across a planar first connector face,

a second member with three or more second connector elements, said elements being distributed across a planar second connector face in a pattern matching that of said first connector elements,

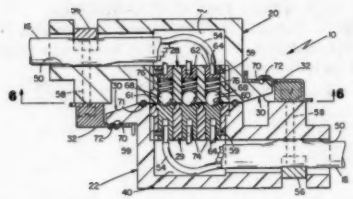
said first connector elements being convex and second con-

nector elements being concave and shaped to mate with said first elements, so as to ensure mating alignment of said first and second elements when said members are in a locked position,

flange-locking means for locking said members together in said locked position, comprising on each member

a flange extending radially of an axis normal to said planar connector face,

a flange receptacle for engaging said flange of the other member when said members are pressed together along said axis and rotated relatively to one another about said axis, and



mating detent protrusions in said flanges and flange receptacles, said detent protrusions engaging in said locked position.

individual springs, at least one for each mating pair of first and second connector elements, each said spring being adapted to resist inward movement of its associated connector element into its associated member, said springs providing

an axial locking force that with said detent protrusions ensures that said members remain in said locked position and

individual mating forces on each mating pair of connector elements to ensure good electrical contact between each mating pair.

4,711,511

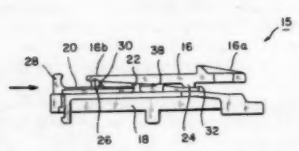
LATCHING APPARATUS FOR AN ELECTRICAL CONNECTOR

Peter Noorily, Bridgewater, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jan. 23, 1987, Ser. No. 6,418

Int. Cl.[4] H01R *13/639*

U.S. Cl. 439—347 **15 Claims**



1. In an electrical connector of the type having a housing and a plurality of electrical contacts therein, latching apparatus comprising:

an elongate member deflectably supported by a pivot on said housing, said pivot being located generally intermediate said elongate member such that both longitudinal ends of said member may move generally transversely toward and away from said housing, one end of said member including a latch for latching to a latch of another mateable connecting device, and

a movable locking bar captively supported on said housing for slidable movement thereon between a first position and a second position, said locking bar and said member including cooperative locking means disposed on both sides of said pivot operative when said locking bar is in said first position to prevent transverse movement of both ends of said member and non-operative when said locking bar is in said second position, thereby permitting transverse movement of both ends of said member.

4,711,512

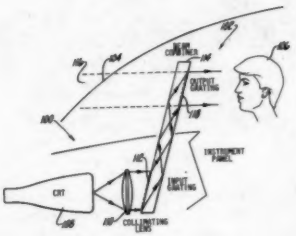
COMPACT HEAD-UP DISPLAY

Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Jul. 12, 1985, Ser. No. 754,406

Int. Cl.[4] G02B *5/32, 27/10*

U.S. Cl. 350—3.7 **8 Claims**



1. A head-up display for use in an aircraft cockpit having a windshield, comprising:

source means for producing collimated light wavefronts of an image to be displayed to the pilot;

an elongated optical element having a first end disposed in the path of the collimated light wavefronts produced by the source means, a second end disposed in the field of view of the pilot through the windshield, and operative to internally reflect optical wavefronts from the first end to the second end;

a first diffractive element supported at the first end of the optical element so that the collimated light wavefronts produced by the source means are incident upon the first diffractive element, the first diffractive element being operative to diffract the light wavefronts into the optical element, and

a second diffractive element supported at the second end of the optical element operative to diffract the light wavefronts, diffracted into the optical element by the first diffractive element, out of the optical element in the direction of the pilot's eye, while retaining the collimation thereof, the second end of the optical element and the second diffractive element being substantially transparent to light incident on the optical element from the field of view of the pilot through the windshield, whereby the pilot views in the image produced by the source means superimposed on his view through the windshield.

4,711,513

LIGHT RADIATOR FOR DIFFUSING LIGHT RAYS WHICH HAVE BEEN TRANSMITTED THROUGH AN OPTICAL CONDUCTOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,200

Claims priority, application Japan, Aug. 8, 1984, 59-166082

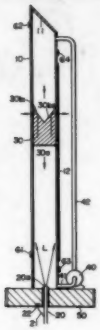
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] C02B *6/00;* **F21V** *7/04*

U.S. Cl. 350—96.10 **2 Claims**

1. A light radiator comprising a transparent cylinder, an optical conductor for guiding light rays into said cylinder through one end of said cylinder, an optical means movably accommodated inside of said cylinder for reflecting said light rays guided into said cylinder from said optical conductor and radiating said light rays outside of said cylinder, and a driving means for moving said optical means along the axis of said cylinder, said optical means comprising a cylindrical transpar-

ent member, a surface of one side of said member on which the light rays impinge being formed on a plane and another surface



of the other side of said member being formed as a V-shaped concave surface.

4,711,514

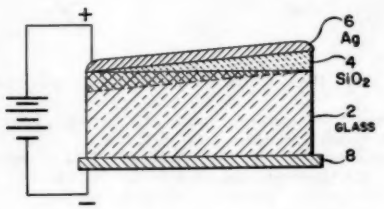
PRODUCT OF AND PROCESS FOR FORMING TAPERED WAVEGUIDES

Gregory L. Tangonan, Oxnard; Huan-Wun Yen, Westlake, and David L. Persechini, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Del.

Filed Jan. 11, 1985, Ser. No. 690,792

Int. Cl.[4] G02B *6/12*

U.S. Cl. 350—96.12 **30 Claims**



28. A tapered optical waveguide device formed by the diffusion of metal ions into a glass substrate through a barrier material of a relatively tight matrix compared to the glass substrate, by a process comprising:

(a) coating the glass substrate with an inert removable barrier material having a tapered thickness inversely related to the sloping depth of the taper desired for the waveguide;

(b) diffusing metal ions through the barrier material into the glass substrate in the presence of elevated heat and an electrical field, the metal ions having a characteristic of increasing the refractive index in the glass substrate and the diffusion process continuing for a period of time sufficient to produce the predetermined depth and slope of the tapered waveguide in the glass substrate, and

(c) removing the barrier material and any metal on the barrier material.

4,711,515

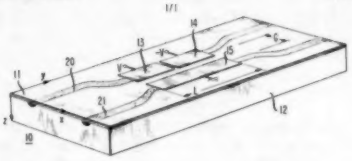
ELECTROOPTIC POLARIZATION MULTIPLEXER/DEMULTIPLEXER

Rodney C. Alferness, Holmdel, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 29, 1984, Ser. No. 614,528

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.14 **8 Claims**



1. A polarization sensitive switching device including

a substrate of birefringent, electrooptic material,

a first and second dielectric waveguide embedded in said substrate and closely spaced together over a distance L,

at least first and second metallic electrodes, said first and second electrode extending for said distance L in the vicinity of said first and second waveguides, respectively, said second electrode including at least first and second portions electrically disconnected from each other and having respective lengths substantially equal to L/2, and

a buffer layer of insulating material intermediate to the electrodes and both the substrate and waveguides, the device characterized in that

the first and second waveguides are substantially phase matched to each other for similarly polarized modes of an input optical signal, and

said distance L is such that $1 \leqq L/l_{TE} \leqq 2$ and $L/l_{TM} \leqq 0.5$, where l_{TE} and l_{TM} are transfer lengths for the TE and TM modes, respectively.

4,711,516

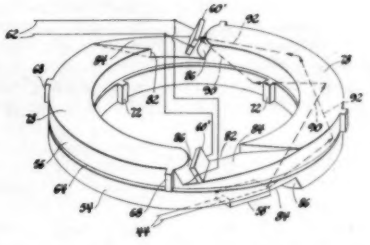
OPTICAL SLIP RING

David W. Graber, Millington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1981, Ser. No. 323,757

Int. Cl.[4] G02B *6/26, 6/42*

U.S. Cl. 350—96.15 **5 Claims**



1. An optical slip ring for coupling light signals between two relatively rotating parts including

first and second rings of homogenous transparent material, each ring having an inner surface slightly spaced from the inner surface of the other ring and an outer surface at least partially surrounded by a medium having a lower index of refraction than the ring to facilitate internal reflection of light within the ring,

means for facilitating efficient light transmission from one ring to another,

coupling means in the outer surfaces of the transparent rings

for coupling light into and out of the rings respectively, and

a pair of coaxial retainers, each fixedly mounted on one of the relatively rotating parts for movement therewith and secured to a respective one of the transparent rings for effecting relative rotation of the rings,

whereby light coupled into the first transparent ring passes through that ring, across the space between the rings, through the second transparent ring and is coupled out of the second ring irrespective of the rotation of the parts.

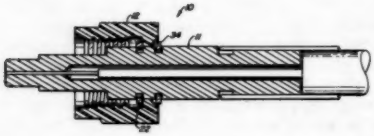
4,711,517
METHOD AND APPARATUS FOR INSTALLING FIBER OPTIC CABLES

Vernon A. Fentress, 4515 Ewing Rd., Castro Valley, Calif. 94546, and Darryl A. Dawson, 798 McAllister St., San Francisco, Calif. 94102

Continuation-in-part of Ser. No. 740,189, May 31, 1985, abandoned. This application Oct. 25, 1985, Ser. No. 791,437

Int. Cl.[4] G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **7 Claims**



1. A new and improved apparatus for use in installing fiber optic cables, said apparatus comprising:

an elongated, generally cylindrical, body with means for securely affixing said body to a fiber optic cable;

said elongated body having a longitudinal bore generally parallel to the axis of said elongated body for receiving therethrough a fiber of the fiber optic cable;

a coupling nut having having means for mating with said elongated body and further means for connecting said fiber optic cable to a communication network device; and

said elongated body further having means disposed along the outer surface of said body for interacting with the mating means of said nut an for receiving and securely retaining said coupling nut such that said fiber optic cable, together with said elongated body, may be connected by said nut to a communication network device; and wherein said coupling nut having an internal circumferential groove about its neck region and said groove having a diameter to contain a flexible retaining ring having an outer diameter substantially less than the outer diameter of said groove such that said ring in its expanded state is maintained in close proximity to the outer diameter of said groove;

said coupling nut receiving and retaining means of said elongated body further including at least one circumferential groove disposed about the outer mid-section surface of said elongated body; and

said elongated body groove having an inner diameter slightly less than the inner diameter of said flexible ring supported in said neck region, and said elongated body having a bevelled ramp so that when said coupling nut with said flexible ring disposed about the groove in its neck region is received by said elongated body , said flexible ring will expand as it is slidably moved over the bevelled land along the elongated body to accommodate the larger outer diameter of the elongated body until said ring and coupling nut neck region are received by the groove in said elongated body where said flexible ring will return to its relaxed state and the coupling nut will be securely mated to said eleongated body.

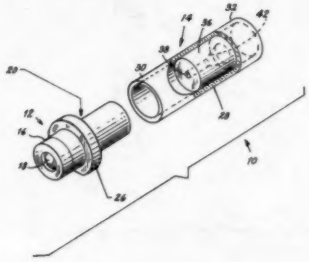
4,711,518
FIBER OPTIC CONNECTOR

Jeffrey B. Shank; Steven E. Swanson, and Barry J. Opdahl, all of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 25, 1985, Ser. No. 801,254

Int. Cl.[4] G02B *6/36, 6/32*

U.S. Cl. 350—96.20 **5 Claims**



1. An optical fiber-lens connector assembly comprising: a lens body formed of transparent material, said lens body including a head end having a lens formed therein, a tail end of substantially cylindrical configuration having an axial cavity therein formed to receive an elastomeric fiber holder, and a shoulder formed intermediate said head end and said tail end and projecting radially outward from said lens body; and a connector for joining an optical fiber to said lens body, said connector comprising: a generally tubular body having a longitudinal axis and a given internal diameter formed to fittingly receive said tail end of said lens body, said tubular body being formed of a material selected from the group of fused silica quartz and borosilicate glasses having a low thermal expansion coefficient, said body having a first end and a second end; and a substantially cylindrical fiber guide positioned within said tubular body intermediate said first and second ends thereof, said fiber guide having an external diameter substantially matching said internal diameter of said tubular body and having a longitudinal, optical fiber receiving aperture therethrough, said fiber guide being formed from the same material as said tubular body.

4,711,519
ASSEMBLY INCLUDING AN OPTICAL FIBER SECURED IN A WALL

Henricus W. W. Smulders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 802,785, Nov. 27, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 948,468

Claims priority, application Netherlands, Dec. 5, 1984, 8403692

Int. Cl.[4] G02B *5/44*

U.S. Cl. 350—96.20 **4 Claims**

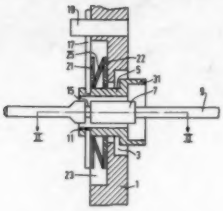
1. An assembly for holding an end of optical fiber, said assembly comprising:

a housing with a wall having an opening therethrough;

a hollow cylindrical holder arranged in the opening in the wall of the housing, said holder having a longitudinal axis and being rotatable around the longitudinal axis with respect to the wall of the housing, said holder having an outer surface with a circumferential groove therein, said holder having a wall with a thickness, said groove having a depth at diametrically opposed portions of the holder which exceeds the thickness of the wall of the holder so as to form two circumferentially extending elongate openings in the holder;

a tubular envelope in which the end of the fiber is secured, said envelope being arranged in the holder to slide in the longitudinal direction, said envelope having an outer

surface with a circumferential groove therein, said groove having an axial position corresponding to that of the groove in the holder; and



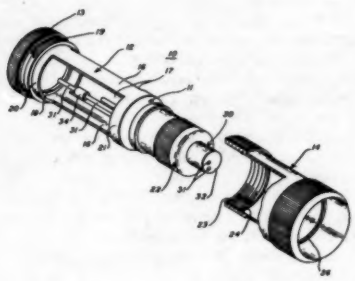
a substantially U-shaped spring attached to the wall of the housing, said spring having two legs pressed into the groove in the holder.

4,711,520

FIBER OPTIC CONNECTOR BACKSHELL

Allen J. Bernardini, Southbury, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Filed Jul. 2, 1985, Ser. No. 751,204
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **4 Claims**



1. A field repairable fiber optic connector backshell for surrounding and protecting one or more fiber optic pairs which are joined together by fiber optic couplers, said backshell comprising:

a cylindrical body,

a coupling ring on a first end of the cylindrical body having means for coupling said backshell to an adjacent member,

a cable clamp on a second end of the cylindrical body for clamping and sealing the backshell to the outer jacket of a fiber optic cable,

an integral frame joining the first end of the cylindrical body to the second end of the cylindrical body,

a pair of opposed longitudinal struts comprising said frame,

a pair of windows defined by the struts, wherein access to the fiber optic pairs and the fiber optic couplers is provided by said windows,

a removable sleeve surrounding the frame portion and means for removably attaching the removable sleeve to the cylindrical body,

seating surfaces on the cylindrical body on opposite ends of the windows, and

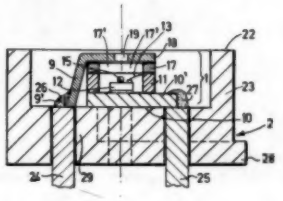
sealing means on the first end and on the second end of the removable sleeve for mating with and sealing against said seating surfaces, whereby said removable sleeve surrounds and protects the fiber optic pairs and fiber optic couplers, and said sealing means and seating surfaces block moisture and other contaminants from said windows when said removable sleeve is attached to the cylindrical body, and whereby said fiber optic pairs and couplers are exposed when said removable sleeve and said sealing means are removed from said cylindrical body.

4,711,521

METHOD OF MANUFACTURING A TERMINAL DEVICE FOR AN OPTICAL FIBER, AND DEVICE THUS OBTAINED

Jacques C. Thillays, Herouville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 778,651
Claims priority, application France, Sep. 28, 1984, 84 14953
Int. Cl.[4] G02B *6/42, 6/32*
U.S. Cl. 350—96.20 **14 Claims**



1. A method of manufacturing a terminal device for an optical fiber, including the positioning of an opto-electronic semiconductor element in a base, a ball lens being secured on said element in order to form an afocal system, as well as the making of electrical connections, characterized in that it includes the following steps:

(a) securing an assembly formed by the ball lens (**15**) and the opto-electronic element (**12**) in position on the bottom (**10**) of a microhousing (**40**);

(b) centering a central aperture (**19**) of a diaphragm (**18**) with respect to the ball lens (**15**), said diaphragm being supported by a lateral portion (**11**) of the microhousing, said central aperture having a diameter which is substantially equal to the outer diameter of an optical fiber (F) and which is larger than that of the ball lens (**15**);

(c) securing said diaphragm (**18**) thus centered in position, thus forming a micro-component (**1**);

(d) arranging the micro-component in said base (**2, 3, 80**) and positioning it with respect to a reference surface (**21, 56, 88**) thereof by introducing a pin (**43**) into said central aperture (**19**) of the diaphragm (**18**), said pin (**43**) itself being positioned with respect to a reference contour (**41**) which cooperates with the reference surface (**21, 56, 88**);

(e) securing the micro-component (**1**) thus centered in position in the base (**2**).

4,711,522

OPTICAL CATHETER

Ronald L. McCartney, Orange, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Continuation-in-part of Ser. No. 546,500, Oct. 28, 1983, abandoned. This application Sep. 27, 1985, Ser. No. 781,411
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **24 Claims**

11. An apparatus comprising:

at least one fiber optic light conductor;

a connector body having an exterior face;

means for mounting the fiber optic light conductor on the connector body with an end of the fiber optic light conductor being adjacent the face and capable of transmitting light to or from a location on said face;

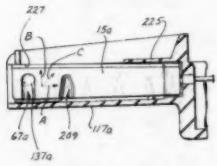
a receptacle having a cavity with an open end for receiving the connector body, a face spaced in a generally forwardly direction from said open end and partly defining

said cavity and means for transmitting light to or from a location on said face of said receptacle;

guide means at least partially on the receptacle for guiding the connector body along a path in the cavity to place said faces in confronting relationship and said locations substantially into engagement;

said connector body having a cam surface at least partially defining a recess; and

said receptacle having biasing means including a projection cooperable with said cam surface when the connector



body is in the cavity of the receptacle and said locations are nearly in engagement for urging the projection in a second direction into the recess, said projection and cam surface cooperating to urge the connector body in a direction which has components which extend farther into the cavity and in a third direction generally transverse to both the forwardly direction and the second direction whereby said locations on said faces are placed in substantial engagement and said cavity allowing the connector body to move in said third direction in response to the cooperation between the cam surface and the projection.

4,711,523

WATERPROOF OPTICAL FIBER CABLE

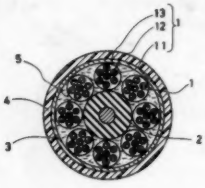
Eiji Iri; Takashi Kaneko; Takeshi Shintani, all of Itami; Kotaro Mio, and Yasuo Ijiri, both of Amagasaki, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Continuation of Ser. No. 637,540, Aug. 3, 1984, abandoned. This application Apr. 15, 1987, Ser. No. 39,806

Claims priority, application Japan, Aug. 11, 1983, 58-147792; Aug. 11, 1983, 58-147793

Int. Cl.[4] G02B 6/44

U.S. Cl. 350—96.23 **3 Claims**



1. An optical fiber cable comprising a water blocking layer, an optical fiber disposed inside the water blocking layer and a water blocking material filling the space between the water blocking layer and the optical fiber, the water blocking material comprising a grease having a worked penetration of 150 to 450 at room temperature and of at least 85 at −30° C. as measured according to ASTM-D-217, said grease comprising an organic liquid having a viscosity at 40° C. of 6 to 5000 c.st. and 3 to 35 parts by weight per 100 parts by weight of said organic liquid of a thickener.

4,711,524

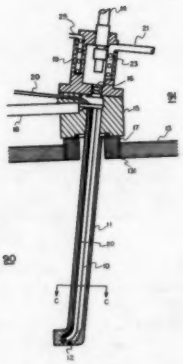
COMBUSTOR FIBERSCOPE

William W. Morey, West Hartford, Conn., and Elias Snitzer, Wellesley, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1985, Ser. No. 773,276

Int. Cl.[4] G02B 6/06

U.S. Cl. 350—96.25 **9 Claims**



1. An apparatus for providing an interior view of a gas turbine combustor during the operation thereof, said apparatus giving access thereto via an aperture in the wall of said combustor, comprising in combination:

a rigid image conduit composed of fused coherent optical fibers extending through said combustor wall aperture, thus having an interior and exterior end;

a viewing lens operably positioned to form an image of said combustor interior on said interior end of said image conduit;

a flexible coherent optical fiber bundle having one end located proximal the exterior end of said image conduit and the other end located distal therefrom;

means for optically coupling said image conduit to said optical fiber bundle;

means for housing said image conduit within said combustor also forming a seal with said combustor wall about said image conduit at said aperture;

means for cooling said image conduit and said viewing lens operably integrated into said housing means; and

means for illuminating said combustor interior co-aligned with said image conduit within said housing means.

4,711,525

POLARIZING OPTICAL FIBER WITH ABSORBING JACKET

John R. Feth, Topanga, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 8, 1985, Ser. No. 731,692

Int. Cl.[4] G02B 6/22

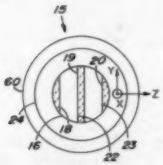
U.S. Cl. 350—96.33 **4 Claims**

1. A polarizing fiber optic waveguide, comprising:

a core formed of a fiber optic material for propagating optical signals, said core including a plurality of layers of fiber optic material, said core being formed to have a first core refractive index n_z for light polarized along a first axis and a second core refractive index n_y for light polarized along a second axis perpendicular to the first axis;

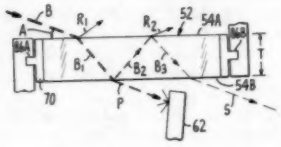
a cladding surrounding said core, said cladding being formed to have a cladding refractive index n_{clad} at least as large as said first core refractive index n_z and less than second core refractive index n_y, the relative magnitudes of the refractive indices n_y, n_y and n_{clad} cooperating to retain

light waves polarized along the first axis in the cladding and to radiate from the core into the cladding light waves polarized along the second axis; and



a jacket surrounding said cladding, said jacket being formed of a material which absorbs light propagating in said cladding such that said jacket absorbs light polarized along the second axis after it has radiated from said core into said cladding.

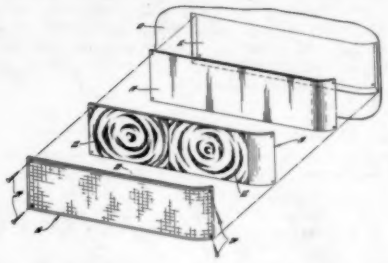
4,711,526
ATTENUATING BEAM SPLITTER
David Hennings, El Granada, and Nubar Manoukian, Cupertino, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.
Filed Jul. 7, 1986, Ser. No. 882,485
Int. Cl.[4] G02B *27/12, 27/14*
U.S. Cl. 350—170 **13 Claims**



1. An apparatus for attenuating the power of a laser beam comprising a refractive element having a pair of spaced-apart, parallel faces, said element being at least partially transmissive to said laser beam and located such that when said laser beam enters said refractive element through one of said faces, said laser beam will be split into at least a primary laser beam and a secondary laser beam both of which exit said refractive element out of the other of said faces, with said primary laser beam exiting said refractive element along a path displaced from the incoming laser beam, and with the secondary laser beam exiting said refractive element after undergoing at least two internal reflections, with the power of the secondary laser beam being attenuated with respect to the incoming laser beam and with the secondary laser beam travelling along the same path as the incoming laser beam.

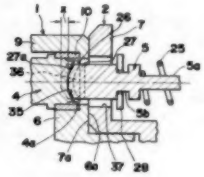
4,711,527
SIMULATED VEHICLE LAMP
Herbert D. Rimmell, Leonard, and John W. Perkins, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 27, 1985, Ser. No. 802,311
Int. Cl.[4] G02B *17/00*
U.S. Cl. 350—243 **3 Claims**

1. A simulated vehicle lamp for use in modeling a vehicle characterized by a light reflecting sheet, a simulated lens sheet having a textured surface giving the visual appearance but not the functional effect of an actual vehicle lamplight focusing



lens, and a magnifying lens sheet interposed between said light reflecting sheet and said simulated lens sheet.

4,711,528
DRIVE COUPLING DEVICE FOR OPTICAL INSTRUMENTS
Makoto Ando, and Yukio Miki, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Aug. 20, 1985, Ser. No. 767,460
Claims priority, application Japan, Aug. 24, 1984, 59-129123[U]
Int. Cl.[4] G02B *7/00*; F16D *1/10, 1/12*
U.S. Cl. 350—257 **15 Claims**



1. A drive coupling device for a first optical instrument provided with a driving means and a second optical instrument provided with a load, comprising;

a drive coupling member rotatably supported in said first optical instrument with its rotational axis extending parallel to an optical axis of said first optical instrument and rotated by said driving means;

a driven coupling member rotatably supported in said second optical instrument with its rotational axis extending parallel to an axis of said second optical instrument and being coupled with said driving coupling member so that said driven coupling member is rotated together with said driving coupling member for shifting sadi load;

motion transmitting means including a recess formed in one of the coupling members and a projection formed on the other of the coupling members for coupling with said reces when the angular positions of said coupling members are coincident with each other so as to transmit the rotation from said driving coupling member to said driven coupling member;

means for biasing at least one of said coupling members along the rotational axis for axially coupling said coupling members with each other;

a first guide surface formed at the tip end of said one of the coupling members so as to be brought into axial contact with said projection under a biasing force of said biasing means when the angular positions of said coupling members are not coincident with each other thereby guiding said projection therealong for aligning the rotational axes of said coupling members with each other; and

a second guide surface formed at the bottom of said recess so as to be brought into axial contact with said projection under a biasing force of said biasing means when the angular positions of said coupling member are coincident with each other thereby guiding said projection therealong for aligning the rotational axes of said coupling members with each other.

4,711,529

OPTICAL INTERFACE APPARATUS

Anthony P. Baker, New York, N.Y., assignor to ITT Defense Communications, a Division of ITT Corporation, Nutley, N.J.

Filed Nov. 5, 1985, Ser. No. 795,149
Int. Cl.[4] G02F 1/133
U.S. Cl. 350—331 R **17 Claims**

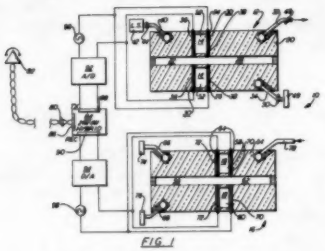


FIG. 1

1. An optical interface apparatus comprises:

means, employing a first liquid crystal material, for modulating a carrier light beam in accordance with a time varying electrical signal;

means, employing a second liquid crystal material, for modulating an electromagnetic field in accordance with a modulated light beam; and

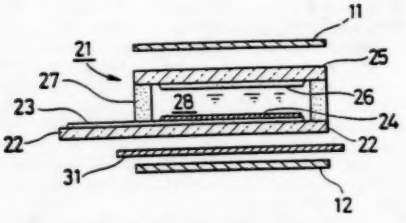
means for providing a time varying signal to said carrier light beam modulating means, said time varying signal providing means including an analog-to-digital converter whereby said carrier light beam is modulated in accordance with the digital output of said analog-to-digital converter.

4,711,530

LIQUID CRYSTAL DEVICE HAVING BIREFRINGENT PLATE NEXT TO POLARIZER

Jun Nakanowatari, Miyagi, and Mitsuru Kano, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 24, 1986, Ser. No. 911,236
Claims priority, application Japan, Sep. 27, 1985, 60-214241
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—339 R **5 Claims**



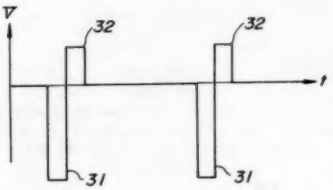
1. A liquid crystal device comprising a liquid crystal cell in which a ferroelectric liquid crystal is put between two transparent substrates each formed with a transparent electrode to the inside thereof with the peripheral edges of said transparent substrates being sealed, a polymer film having a birefringent property appended on one side of said liquid crystal cell and two sheet polarizing plates disposed on both sides of said liquid crystal cell and such that the polarizing directions thereof are perpendicular to or in parallel with each other.

4,711,531

FERROELECTRIC LIQUID CRYSTAL DISPLAY APPARATUS USING A RESET VOLTAGE STEP

Sadao Masubuchi, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 770,938
Claims priority, application Japan, Sep. 11, 1984, 59-189997
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—350 S **4 Claims**



1. A liquid crystal display apparatus comprising:

a plurality of scanning electrode means;

a plurality of signal electrode means positioned perpendicular to the scanning electrode means to form a matrix and enclosing a ferroelectric liquid crystal layer having a plurality of pixels in conjunction with the scanning electrode means;

first drive means for selecting and sequentially driving the scanning electrode means by applying write-in voltages thereto;

second drive means for driving the signal electrode means by applying voltages corresponding to display contents of the display apparatus in synchronism with the application of the write-in voltages; and,

control means coupled to the first and second drive means, for controlling the first drive means so as to apply reset voltages to the respective pixels of the ferroelectric liquid crystal layer, whereby orientation of the liquid crystal's molecule is subjected to be constant before the selection of the scanning electrode means.

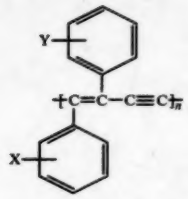
4,711,532

NOVEL DIACETYLENIC AND POLYDIACETYLENIC COMPOSITIONS

Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 854,273, Apr. 21, 1986, Pat. No. 5,207,116.
This application Dec. 17, 1986, Ser. No. 942,638
Int. Cl.[4] G02B 5/23; G02F 1/01, 1/03
U.S. Cl. 350—354 **5 Claims**

1. An electrooptic light modulator device with a polymeric nonlinear optical component comprising an optically transparent medium of a polymer characterized by the recurring monomeric unit:



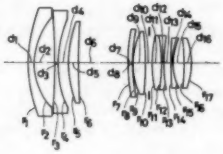
where X is an electron-donating substituent; Y is an electron-withdrawing substituent; and n is an integer of at least 3.

4,711,533

STANDARD ZOOM LENS SYSTEM HAVING A LARGE APERTURE RATIO

Yoshiharu Saito, Koganei, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,422
Claims priority, application Japan, Aug. 20, 1984, 59-171509
Int. Cl.[4] G02B *15/14, 13/18*
U.S. Cl. 350—426 **8 Claims**



1. A standard zoom lens system with a large aperture ratio comprising a front lens group having a negative refracting power, a rear lens group having a positive refractive power, in which the airspace between said front lens group and said rear lens group is variable for effecting zooming, said zoom lens system comprising a diaphragm and a positive lens component disposed at the outer side of said diaphragm on the object side, and at least one surface of said positive lens component being aspherical satisfying the following condition (1):

$$-0.001 > \Delta x/R_A > -0.007 \quad (1)$$

where R_A represents the radius of curvature of a reference spherical surface, Δx represents the difference parallel to the optical axis between the point on said aspherical surface and that on said reference spherical surface at the maximum effective aperture of the aspherical lens.

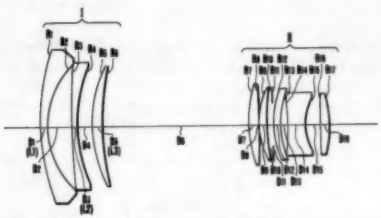
4,711,534

ZOOM LENS ABLE TO OBTAIN FOCAL LENGTHS BEYOND THE ZOOMING RANGE

Takashi Matsushita, Kanagawa; Sadatoshi Takahashi, Tokyo; Keiji Ikemori, Kanagawa; Nozomu Kitagishi, Tokyo; Tsunefumi Tanaka, and Kikuo Momiyama, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,567
Claims priority, application Japan, Feb. 27, 1984, 59-35612
Int. Cl.[4] G02B *7/04, 15/16*
U.S. Cl. 350—426 **8 Claims**

1. A zoom lens comprising first lens means of negative refractive power and second lens means of positive refractive power arranged on the image side of said first lens means, the axial separation between said first lens means and said second lens means being varied to vary the focal length of the entire system in a prescribed range, when the wide angle side of the range is reached, said first lens means is adjusted in position to focus the zoom lens to an object at a finite distance, and then at least said second lens means is moved rearward so as to expand the picture angle beyond the wide angle end of the zoom lens.

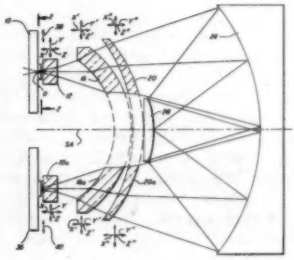


4,711,535

RING FIELD PROJECTION SYSTEM

David R. Shafer, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 10, 1985, Ser. No. 732,764
Int. Cl.[4] G02B *17/00*
U.S. Cl. 350—442 **8 Claims**



1. A ring field projection system comprising, in combination:
at least one concave and one convex mirror arranged around an optical axis in face-to-face relationship with their centers of curvature being nearly concentric and falling on said axis, the convex mirror being smaller than and having a smaller radius of curvature than the concave mirror;
means defining an object location and a conjugate real image location, said convex mirror being positioned to reflect to said concave mirror light from said object location initially reflected from said concave mirror whereby light from said object location will be reflected at least twice at said concave mirror and at least once at said convex mirror before being focused at the image location;
means for limiting the image field to an annular zone centered about the optical axis;
a first thick, flat parallel plate mounted in the light path between the object and image locations adjacent said object location;
a second thick, flat parallel plate nearly identical to said first plate mounted in the light path between the object and image locations adjacent said image location;
strong meniscus element means, mounted in the light path between said object and image locations at a spaced distance from said plates, for reducing spherical aberrrations of the principal rays and introducing chromatic aberrations, the two radius of curvatures of said strong meniscus element means differing by at least 20 percent; and
weak meniscus element means, mounted in the light path between said object and image locations adjacent said

strong meniscus element means, for reducing spherical aberrations of the principal rays and introducing chromatic aberrations, the two radius of curvatures of said weak meniscus element means differing by at least 10 percent;

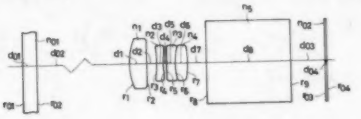
said plates and elements being constructed and arranged so that both said meniscus element means reduce spherical aberrations of the principal rays in the system and introduce chromatic aberrations which are substantially cancelled by said thick, flat parallel plates.

4,711,536

COLOR SEPARATING LENS COMPOSED OF THREE LENS UNITS

Taira Kouchiwa, Kamakura, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 759,055
Claims priority, application Japan, Jul. 25, 1984, 59-154949
Int. Cl.[4] G02B *9/14*
U.S. Cl. 350—476 **2 Claims**



1. A color separating lens composed of three lens units comprising a first unit lens which is a positive single meniscus lens (a first lens) having a convex surface directed toward an object side, a second unit lens which is a double-concave lens (a second lens), a third unit lens having a negative meniscus lens (a third lens) having a concave suface directed toward an image side and a double convex lens (a fourth lens) cemented together, and a fourth unit lens which is a parallel plane glass (a fifth lens), said color separating lens composed of three lens units being satisfied with the following conditions:

(1) $5.5f < r_2 < 6.5f$
(2) $8f < r5 < 16f$
(3) $0.1f < d1 < 0.15f$
(4) $0.02f < d4 < 0.04f$
(5) $1.75 < n1 < 1.85$, $41 < v1 < 53$
(6) $1.75 < n4$, $38 < v4 < 50$
(7) $50 < v5$

where is a radius of curvature of the first lens on the image side, r5 a radius of curvature of the third lens on the object side, d1 a wall-thickness of the first lens, d4 an air spacing between the second lens and the third lens, n1 is a refractive index of the first lens, n4 is a refractive index of the fourth lens, v1 an Abbe's number of the fourth lens, V5 an Abbe's number of the fifth lens, and f a synthetic focal length of the entire system.

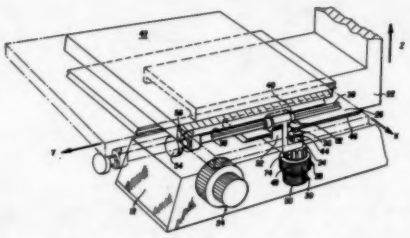
4,711,537

STAGE FOR A MICROSCOPE

Klaus P. Schindl, Vienna; Franz Meitz, Bisamberg, and Kurt Salzmann, Vienna, all of Austria, assignors to Reichert-Jung Optische Werke AG, Vienna, Austria

Filed Jun. 12, 1986, Ser. No. 873,360
Int. Cl.[4] G05G *11/00*; G12B *9/00*; G02B *21/26, 21/32*
U.S. Cl. 350—531 **13 Claims**

1. A stage for a microscope comprising a stage carrier, an object stage, an intermediate carrier disposed between the stage carrier and the object stage, first displacement means adapted to displace the intermediate carrier in a first direction relative to the stage carrier, second displacement means adapted to displace the object stage in a second direction substantially transverse to the first direction, said first and



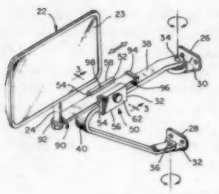
second displacement means being fixed relative to the stage carrier.

4,711,538

ADJUSTABLE SUPPORT DEVICE FOR VEHICLE SIDE VIEW MIRROR

Gary L. Ohs, and Timothy W. Byers, both of Whitefish, Mont., assignors to Creative Sales & Mfg. Co., Inc., Whitefish, Mont.

Filed Sep. 29, 1986, Ser. No. 912,987
Int. Cl.[4] B60R *1/06*; G02B *7/18*
U.S. Cl. 350—604 **5 Claims**



1. In a side mounted rear view mirror assembly for vehicles including a pivotal mounting frame bracket which is mounted on a vehicle exterior panel and wherein said bracket includes a generally horizontal upper support section, the improvement, comprising:

(a) a generally rectangular adapter block means detachably and slidably mounted on said upper support section of said bracket and including a first inside end and a second outside end and having a first slot extending from said first to said second end for being received on said upper support section, said block means also including a second slot means above said first slot means extending from said first to said second end, said adapter bar being divided into two parts,

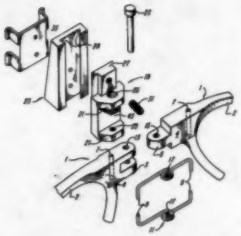
(b) an elongated slide adjustment bar means having an outer mirror mounting end and an inner retaining end and being slidably received in said second slot means of said block means for limited reciprocally slidable movement in said second slot, said bar means supporting a rear view mirror at its outer mirror mounting end, and

(c) said block means including a releasable lock means for adjustably holding said bar means such that said rear view mirror is positionable as desired between a first retracted position and a second extended position.

4,711,539
SUPPORT STRUCTURE FOR PROTECTIVE MASK OPTICAL INSERT

James J. Krusas, Sturbridge, and Joseph J. Pienta, Southbridge, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jun. 18, 1985, Ser. No. 746,178
Int. Cl.[4] G02C 5/08, 1/00; A61F 9/02
U.S. Cl. 351—63 10 Claims



1. Apparatus for supporting a protective mask optical insert to be used by a person wearing a protective face mask of the type having left and right face plates and a structural member between said face plates, said support apparatus comprising:

(a) a hinged frame assembly, including:

a pair of ring-shaped frames, each adapted to hold a single optical lens, each frame including:

an eyewire; and

a hinge portion;

said frames being hingedly connected to each other by means of a spring loaded hinge that allows said frames to swing toward each other;

each eyewire defining a plaene in which the perimeter of said eyewire lies;

means for maintaining a specified face-form angle defined by the intersection of the two said planes defined by each of the eyewires;

(b) means for anchoring the hinged frame assembly to the protective mask;

(c) means for permanently setting the pantoscopic angle between the user's face and the hinged frame assembly including a block having a trapezoidal cross-section, said trapezoidal block, having two pairs of parallel faces and a pair of faces inclined to each other, arranged so that a first face of the inclined pair is attachable to said anchoring means, and the second face of the inclined pair is attachable to the hinged frame assembly; and

(d) slidably releasable means for attaching the hinged frame assembly to the means for setting the pantoscopic angle.

4,711,540
EYE DISEASE INSPECTING INSTRUMENT

Hisakazu Yoshino, Tokyo; Shinichi Nishimura, Ageo, and Kazuyuki Sasaki, Kanazawa, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

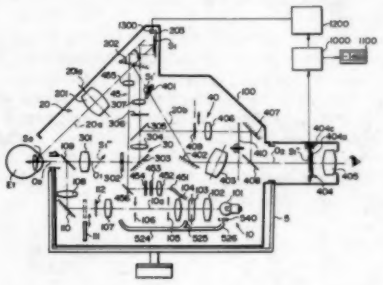
Filed Jan. 3, 1985, Ser. No. 688,586
Claims priority, application Japan, Jan. 4, 1984, 59-178; Jan. 4, 1984, 59-179; Aug. 10, 1984, 59-167662; Aug. 10, 1984, 59-167663
Int. Cl.[4] A61B 3/10
U.S. Cl. 351—214 17 Claims

1. An eye disease inspection instrument, comprising:

a slit light projection optical system including a projection lens having a projection optical axis and a slit aperture for projecting a slit light flux to a fundus via a crystalline lens of a patient's eye, said projection lens forming an image of said slit aperture on the crystalline lens so as to cut optically the crystalline lens for forming an optical section thereof;

a first observation optical system including a first objective lens having a first optical axis which intersects said projection optical axis for imaging an intermediate range of the optical section of the crystalline lens;

a second observation optical system including a second objective lens having a second optical axis which is substantially coaxial with respect to a part of said projection optical axis, said second observation optical system being arranged for imaging an intermediate image of a retroillumination image of the crystalline lens resulting from illumination of the crystalline lens from the back of the light flux reflected at the fundus of the patient's eye;



ocular means positioned for observing both the intermediate images of the optical section and the retroillumination image;

optical path selection means positioned for alternately selecting one of the first and second observation optical systems for observation by said ocular means;

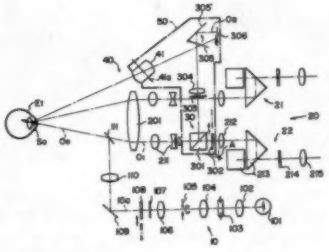
said slit light projection optical system including a polarizer having a first polarization axis; and

said second observation optical system including an analyzer which has a second polarization axis lying perpendicular to the first polarizing axis and which is retractable from an optical path of said second observation optical system.

4,711,541
SLIT LAMP AND ACCESSORY DEVICE THEREOF

Hisakazu Yoshino, Tokyo; Shinichi Nishimura, Ageo, and Kazuyuki Sasaki, Kanazawa, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 695,900
Claims priority, application Japan, Feb. 2, 1984, 59-17569; Aug. 10, 1984, 59-167664
Int. Cl.[4] A61B 3/14, 3/10
U.S. Cl. 351—214 14 Claims



1. A slit lamp comprising:

a slit light projection optical system including a projection lens and a slit aperture for projecting a light flux to a fundus via a crystalline lens of a patient's eye, and first

polarizing means for polarizing said light flux, said projection lens forming an image of said slit aperture onto the crystalline lens so as to cut optically the crystalline lens for forming an optical section thereof;

microscope means, having an objective lens, for observing the optical section of the crystalline lens;

a first recording optical system including a photographing lens and recording means, said photographing lens having a principal plane which intersects an extension of an image plane on said recording means of said first recording optical system in an extension of a slit projection plane, said photographing lens forming an image of the optical section of the crystalline lens onto said recording means; and

a second recording optical system, being composed of said objective lens of said microscope means, light deflection means, analyzing means having a polarization axis rectangular to that of the first polarizing means, and an imaging lens, for guiding and imaging on the recording means of said first recording optical system a retroillumination image of the crystalline lens resulting from illumination of the lens from the back by the light flux reflected at the fundus of the patient's eye.

4,711,542

OPHTHALMIC DISEASE DETECTION APPARATUS

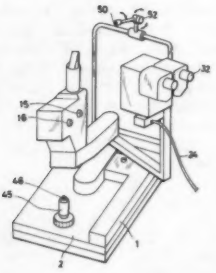
Tadashi Ichihashi, Toyohashi; Koichiro Kakizawa, Okazaki, and Masunori Kawamura, Aichi, all of Japan, assignors to Kowa Company Ltd., Aichi, Japan

Filed May 22, 1986, Ser. No. 866,582

Claims priority, application Japan, May 22, 1985, 60-108297

Int. Cl.[4] A61B *3/10*

U.S. Cl. 351—221 **4 Claims**



1. An apparatus for detecting ophthalmic diseases in the lens of a patient's eye comprising:

a laser for producing a laser beam;

means for focussing said laser beam at a selected spot in the lens of said patient's eye;

photoelectric converting means for receiving light scattered from said lens and converting same into an electric signal;

an autocorrelator for determining an autocorrelation function in response to an electrical signal received from said photoelectric converting means; and

means for calculating the distribution of protein particles in the lens of said eye in terms of the diameters thereof in response to an output signal from said autocorrelator.

4,711,543

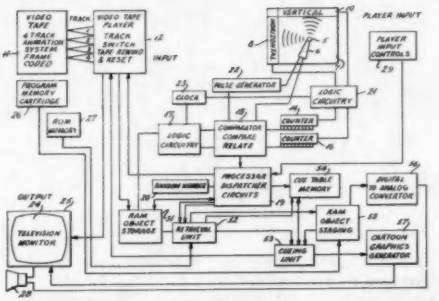
TV ANIMATION INTERACTIVELY CONTROLLED BY THE VIEWER

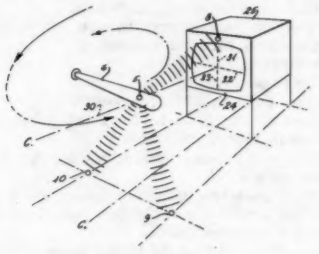
Preston E. Blair, 26212 Mesa Dr., Carmel, Calif. 93923, and Frank S. Preston, 3860 Dixon Pl., Palo Alto, Calif. 94306

Division of Ser. No. 831,170, Apr. 14, 1986, which is a continuation of Ser. No. 526,464, Aug. 25, 1983, abandoned. This application Jan. 29, 1987, Ser. No. 8,644

Int. Cl.[4] G03B *21/32*

U.S. Cl. 352—87 **1 Claim**





1. A method of animating multiple tracks of motion picture production of different actions of the same character providing the means of repeated jump-switching from multiple tracks of animation action to multiple tracks of animation action during the action in a scene, while retaining in this process a smooth and logical sequence of drawing progression, the steps of the method comprising:

recording the drawing number frame exposure of multiple actions of the same character on animation exposure sheets, scheduling specific frames wherein the actions coincide into the same drawing, or similar drawings occupying the same area, whereafter switching of animation action tracks may occur; said drawings of coinciding multiple actions being positions in the following types of animation actions:

1. angular change of direction,
2. circular change of direction,
3. momentary parallel of multiple actions,
4. animation character cycles,
5. animation character cycle actions progressing in a stationary position on a moving background,
6. fast animation character turning and twirling actions,
7. foreshortened perspective actions of animation characters progressing directly to or from the camera,
8. animation actions of anticipation/action/reaction,
9. actions of a burst of speed,

planning the paths of action of said multiple actions leading into and out of the above types of coinciding animation actions on layout drawings and graphically locating the field position of drawings wherein the multiple tracks coincide to allow track switching,

laying out projected key drawings of the scene in said paths of action, including those drawings in the above types of animation actions wherein the multiple actions coincide,

recording the field size of the frames exposed (on exosure sheet) of drawings of coinciding tracks on animation exposure sheets, and recording the measurements of the N/S and E/W coordinates of the field location of the centers of said drawings with respect to two mutually perpendicular sides of the scene field on said frames,

animating the drawings of said multiple actions of the same character according to the said layout paths of action and projected key drawings, forcing the animation of multiple actions into a distortion of direction, of drawing spacing, and of cycle construction to coincide into the same drawing, or a similar drawing with loss of silhouette definition, being positions in the following types of animation action, specifically as:

1. In animation actions of angular change of direction the drawing of coinciding tracks is positioned at the extreme corner of reversal, and is followed by a drawing leading in an angular change of direction;
2. In animation actions of circular change of direction the drawing of coinciding tracks is positioned at the center of the curve of reversal or the extremity of said action prior to reversal,
3. In the momentary parallel of multiple actions the drawing of coinciding tracks is positioned between the extremes of the actions during the lift or sink of the character and at the greatest loss of silhouette definition,
4. In animation character cycle actions the drawing of coinciding tracks may occur at the mutual point of greatest silhouette definition loss and at either the recoil, lift, or high point of the cycle,
5. In animation character cycle actions progressing in a stationary position on a moving background the drawing of coinciding tracks occurs at the lift point after the recoil, or at the sinking position, and with a loss or coinciding of silhouette definition,
6. In fast animation characer turning or twirling actions the drawing of coinciding tracks occurs at the center of the turning or twirling,
7. In foreshortened perspective actions of animation characers progressing directly to or from the camera, the actions are forced into similar drawings of the same area and with a loss of silhouette definition at the drawing of coinciding tracks,
8. In animation actions of deliberate anticipation, quick action, and deliberate recoil the center of the acton when silhouette definition is lost is the drawing of coinciding tracks,
9. In actions of a burst of speed the drawing of coinciding tracks occurs at the center of the burst of speed which may be a blurred or streaked drawing,
10. In animation actions comprising a combination of the above actions,

producing multiple tracks of camera-originated animation film negative,

frame coding multiple track film composite, video tape transfer, or video disc transfer, placing frame data of the drawings of coinciding tracks allowing track switching, with data of said drawing location coordinates for each scene, at the start of the scene for access by random access memory storage unit.

4,711,544

DISPLAY SYSTEM FOR VEHICLE

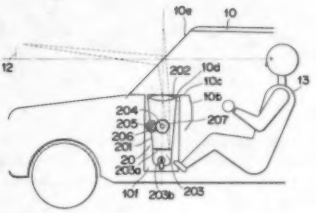
Tadashi Iino; Yoshikazu Nagashima, and Masaya Sugita, all of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,126

Claims priority, application Japan, Apr. 12, 1985, 60-53550[U]; Sep. 11, 1985, 60-138013[U]; Sep. 11, 1985, 60-138014[U]; Oct. 18, 1985, 60-158724[U]; Oct. 25, 1985, 60-162966[U]; Oct. 25, 1985, 60-237634; Nov. 29, 1985, 60-182951[U]; Mar. 12, 1986, 61-34577[U]

Int. Cl.[4] G03B *21/00*

U.S. Cl. 353—14 **18 Claims**



1. A display for a vehicle, said system conprising:

a projective display means mounted on the vehicle and having a display device for displaying data, said projective display means functioning to project a display image of said display device onto a front glass of the vehicle, thereby forming a virtual image of said display image in front of said front glass, said projective display means having a rotatably supported housing for housing said display device, and a rotational axis on which said housing is mounted, said rotational axis extending through said housing, said projective display means further having an optical system for projecting said display image of said display device onto said front glass, said display device being disposed within a focus of said optical system;

a position adjusting means for adjusting the position of said virtual image formed in front of said front glass by shifting a projective optical axis from said projective display means to said front glass, said position adjusting means having an electric motor for rotating said housing about said rotational axis, a projective display position of said display image onto said front glass being changed upon rotation of said housing about said rotational axis by said electric motor;

an external light detecting means for detecting an external light incident from the exterior through said optical system, said external light detecting means outputting an electrical signal proportional to the magnitude of the external light; and

a preventing means for preventing an external light from being incident on said display device through said optical system when the level of the external light incident through said optical system is above a predetermined value, in accordance with the electrical signal provided from said external light detecting means.

4,711,545

FILM ADVANCE MECHANISM

Rolf Crema, Ehringshausen-Greifenthal, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jul. 21, 1986, Ser. No. 887,427

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529618

Int. Cl.[4] G03B *1/02*

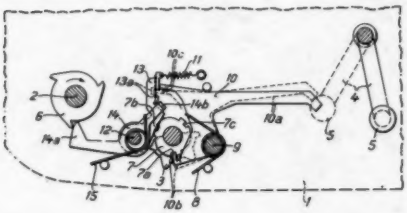
U.S. Cl. 354—213 **8 Claims**

1. A film advance mechanism for producing a uniform image

position of perforated film in a photographic camera for each successive exposure, comprising:

a film transport sprocket engaging with the film perforations;

a profiled locking mechanism responsive to a film winding mechanism on the camera for locking the film transport sprocket toward the end of each film advance, the profiled



locking mechanism comprising a detent wheel mounted on the film transport sprocket, a detent lug and means for engaging the detent lug in the detent wheel at the end of each film advance; and

a roller operatively connected with the camera shutter and the detent lug such that the roller lifts the detent lug out of the detent wheel after completion of a camera shutter cycle.

4,711,546

PHOTOMETRIC CIRCUIT

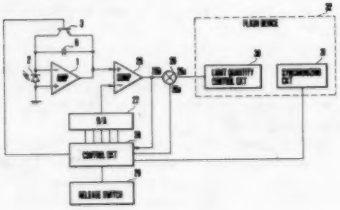
Tadashi Okino, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,259, Oct. 18, 1984, abandoned. This application Aug. 7, 1986, Ser. No. 894,384

Claims priority, application Japan, Oct. 19, 1983, 58-195617; Nov. 11, 1983, 58-210909; Nov. 11, 1983, 58-210910

Int. Cl.[4] G03B *7/08*

U.S. Cl. 354—425 **31 Claims**



1. A photometric circuit comprising:

(a) a capacitor to be charged by photo current;

(b) switching means for discharging the electric charge of said capacitor;

(c) amplifying means for amplifying the voltage of said capacitor;

(d) operating means for performing an operation on the output of said amplifying means and a reference value;

(e) detecting means for detecting output level of said amplifying means while the electric charge of said capacitor is being discharged by said switching means; and

(f) setting means for setting said reference value according to an output of said detecting means.

4,711,547

DISPLAY DEVICE

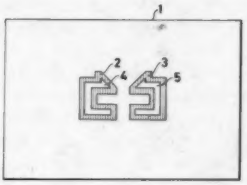
Kiyoshi Iizuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha

Filed Nov. 27, 1985, Ser. No. 802,751

Claims priority, application Japan, Nov. 28, 1984, 59-252278; Nov. 16, 1985, 60-171663

Int. Cl.[4] G03B *17/18*

U.S. Cl. 354—471 **8 Claims**



1. A display device for photographing information of a camera, comprising:

first display means which has an optical density thereof varied as a voltage is applied thereto for forming photographing information;

second display means which emits light as a voltage is applied thereto thus forming information with a same content as that of the photographing information formed by said first display means; and

supply means for selectively supplying the voltage to said first display means and said second display means depending on brightness of an object to be photographed.

4,711,548

ASSEMBLY STRUCTURE OF PRINTED CIRCUIT BOARDS FOR CAMERA

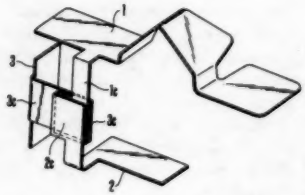
Kazuhiko Arakawa, Tokyo; Jun Terashima, and Go Tokura, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,998

Claims priority, application Japan, Dec. 14, 1985, 60-281539; Dec. 14, 1985, 60-281540

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—485 **10 Claims**



1. A camera having electrical circuits arranged on an assembly of flexible printed circuit boards, comprising:

(a) a first flexible printed circuit board arranged on a first face of a framework of said camera, said board having an extension bent to the direction of a second face of said framework;

(b) a second flexible printed circuit board arranged on a third face of said framework, said board having an extension bent to the direction of said second face; and

(c) a third flexible printed circuit board arranged on a fourth face of said framework, said board having an extension bent to the direction of said second face, whereby said extensions each are provided with a conductor for electrical connection, and all said bent-off portions are superimposed one upon another and on said second face so that

the wires of any adjacent two of said printed circuit boards are electrically connected to each other at said connectors.

4,711,549

CONTACT FIXING DEVICE WITH AN IMPROVED CLEANING MECHANISM

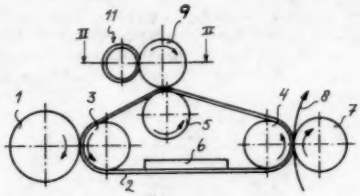
Roodbeen, Leonardus F. H., NV Kronenberg, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Jun. 9, 1986, Ser. No. 872,218

Claims priority, application Netherlands, Jun. 14, 1985, 8501718

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 FU **2 Claims**



1. A contact fixing device comprising a fixing surface made from a somewhat resilient material, a means for driving the fixing surface, a means for heating the fixing surface, a pressure surface which presses against the fixing surface forming a fixing zone through which copy material can be fed for fixing a toner image thereon, a means for driving the pressure surface, a hollow perforated cleaning roller which while rotating in contact with the fixing surface takes up toner from the fixing surface and a disc roller, the circumference of which is covered with a somewhat resilient material, provided near each end of the cleaning roller such that it presses against the cleaning roller to prevent toner from flowing over the ends thereof and is thereby rotationally driven.

4,711,550

ELECTROSTATIC COPYING APPARATUS

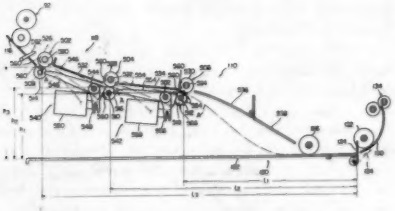
Yasuji Sumida, Kitakatsuragi; Hiroshi Kajita, Kobe, and Tadashi Fujioka, Toyonaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 793,094, Oct. 30, 1985, Pat. No. 4,671,644. This application Aug. 20, 1986, Ser. No. 900,164

Claims priority, application Japan, Oct. 30, 1984, 59-226719; Nov. 30, 1984, 59-251565; Nov. 30, 1984, 59-251567; Mar. 30, 1985, 60-64982; Jul. 9, 1985, 60-149176

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 SH **7 Claims**



1. In an electrostatic copying apparatus including means for introducing selectively into a copying paper returning passage a copying paper sheet having an image formed on one surface by conveying the sheet through a copying paper conveying passage, returning the sheet through said returning passage to a paper re-sending means disposed below said returning passage and then re-feeding the sheet to said paper conveying passage from said paper re-sending means in order to form an image on the other surface of the sheet, said re-sending means including a stopping means to be selectively held at an operating position or at a non-operating position so that when said stopping means is held at said operating position, the leading edge of the sheet returned to said paper re-sending means via said returning passage abuts against said stopping means, said paper returning passage having provided therein a returning mechanism including a plurality of returning roller pairs spaced from each other in the returning direction of the copying paper sheet and return controlling members disposed adjacent said return roller pairs, and means for holding each said return controlling member selectively at a guiding position at which it guides the copying paper sheet delivered from that said return roller pair located upstream thereof to that said returning roller pair located downstream thereof and a non-guiding position at which it guides the copying paper sheet delivered from that said returning roller pair located upstream thereof directly to said paper re-sending means, the improvement wherein:

at least one of said returning roller pairs of said returning mechanism has annexed thereto a forced detaching means for detaching a trailing end portion of the copying paper sheet which has passed the nipping site of said one returning roller pair forcibly downwardly from said one returning roller pair, and thus for, even when the copying paper sheet is returned directly to said paper re-sending means from said one returning roller pair and the length of the copying paper sheet in the moving direction is greater than the paper returning length from said nipping site of said one returning roller pair to said stopping means held at said operating position thereof, surely detaching downwardly the trailing end portion of the copying paper sheet from said one returning roller pair when the trailing end of the copying paper sheet has passed the nipping site of said one returning roller pair.

4,711,551

DEVELOPING APPARATUS

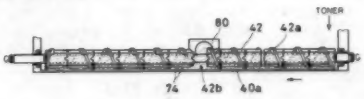
Akihiko Fujio; Hiroshi Iwaki; Kunio Tsuboi, and Akihiko Sutoh, all of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Sep. 10, 1986, Ser. No. 907,738

Claims priority, application Japan, Sep. 13, 1985, 60-204148; Nov. 19, 1985, 60-177604

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **11 Claims**



1. A developing apparatus for electrophotography comprising:

stirring means for stirring a developer wherein carrier and toner are mixed while transferring the same from a starting end to a finishing end thereof,

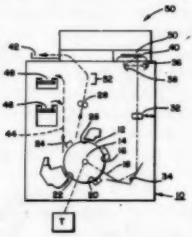
transfer-interrupted portion formed at a part of a transferring path of said stirring means, and

a level sensing means installed at said transfer-interrupted portion for sensing a level of said developer at said transfer-interrupted portion.

4,711,552
SYNCHRONIZING ELECTROSTATIC COPY FORMATION

Bea A. Nilsson, Boulder, and Roger D. Shepherd, Rollinsville, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1986, Ser. No. 864,406
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **30 Claims**



22. In an electrophotographic copier having an optics assembly, a method for synchronizing the movement of the leading edge of a copy sheet and the movement of the leading edge of an electrostatic image on a photoreceptor, comprising the steps of:

positioning a master document with a colored area adjacent to its leading edge and a colored area adjacent to its trailing edge on the document glass of the copier,

initiating the copying cycle of the copier to produce a copy, determining the length of undeveloped area adjacent to the leading edge or trailing edge of the copy,

and adjusting the start of scan of the optics assembly as a function of any such length.

29. In a device having an optics mechanism for forming visible images on cut sheets, apparatus for synchronizing the movement of the leading edge of the cut sheet and the movement of the leading edge of an electrostatic image on the photoreceptor of the device, comprising:

means to inactivate the optics mechanism of the device,

means to initiate the operating cycle of the device to produce a visible image on a cut sheet with the optics mechanism inactivated,

means to determine the length of undeveloped area adjacent the leading or the trailing edge of the cut sheet,

and means to adjust the gating of the cut sheet as a function of any such length.

4,711,553
IMAGE FORMING APPARATUS WITH A PLURALITY OF COLORS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 6, 1986, Ser. No. 893,636
Claims priority, application Japan, Aug. 13, 1985, 60-177841; Aug. 28, 1985, 60-189237
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 **4 Claims**

1. An image forming apparatus with a plurality of colors, said apparatus comprising:

an original table for placing thereon an original which possesses at least a first color and a second color;

original scanning means for optically scanning an original placed on said original table, said means having an optical system to guide the image reflecting light coming from the original into a given light path;

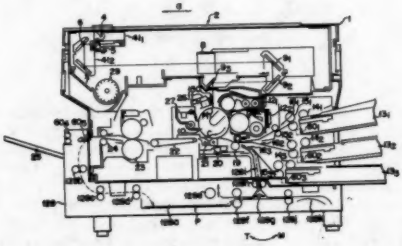
first and second color component detection means for transmitting electric signals corresponding to said first and second colors in response to the image reflecting light, said means being movably provided on said light path along which said image reflecting light coming from said optical system of said original scanning means passes;

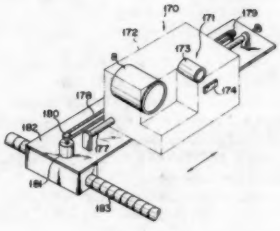
original color identifying means for identifying different color areas from the electric signals for said first and second colors transmitted from said first and second color component detection means and for storing the first and second color data and first and second positional data for the first and second colors in different color areas;

image forming means for forming an image of given colors of the original on an image forming medium by using said image reflecting light coming from said optical system of said original scanning means and by selectively driving first and second developing units which correspond to said first and second colors, respectively;

image erasing means for selectively erasing an image to be formed by said image forming means;

image forming medium return means for selectively returning said image forming medium to said image forming means after formation of an image by said image forming means;





first control means for producing a first control signal to drive said original scanning means and said first and second color component detection means prior to actual formation of an image;

second control means for reading out, at the time of the first image forming operation, said first color data that have been stored in said original color identifying means to send them to said first developing unit of said image forming means as drive signals and said second position data which correspond to said second color data to send them to said image erasing means as erasure data and for producing a second control signal to said image forming medium return means as an instruction for a return operation; and

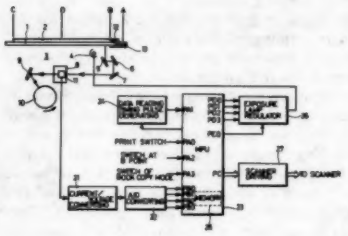
third control means for reading out, at the time of the second image forming operation, said second color data that have been stored in said original color identifying means to send them to said second developing unit of said image forming means and said first positional data which correspond to said first color data to send them to said image erasing means as erasure data.

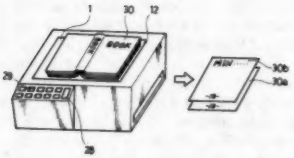
4,711,554

SCANNING TYPE COPYING MACHINE

Kadotaro Nishimori, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 8, 1986, Ser. No. 939,366
Claims priority, application Japan, Dec. 13, 1985, 60-281525
Int. Cl.[4] G03G *15/00, 15/28*
U.S. Cl. 355—8 7 Claims





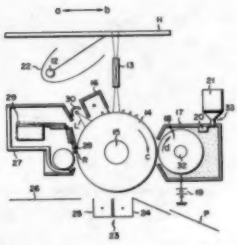
1. A scanning type copying machine comprising:
imaging means comprising scanning means for scanning a document for outputting an image of the document,
mode selecting means for selecting a normal copy mode and a dividing copy mode for copying said document by dividing a copy area of said document,
first control means for controlling said imaging means to copy the whole of said copy area of said document as one sheet in response to selection of said normal copy mode by said mode selecting means and to copy said document by dividing said copy area of said document into two regions in response to selection of said dividing copy mode by said mode selecting means,
image density detecting means for detecting a density of said image of said document by scanning said document by said scanning means prior to copy operation,
density control data setting means for setting density control data for the whole of said copy area of said document based on the detected output of said image density detecting means when said normal copy mode is selected by said mode selecting means, and for setting density control data for each of said divided two regions of said document based on the detected output of said image density detecting means when said dividing copy mode is selected by said mode selecting means, and
second control means for controlling said imaging means to form a copy of an appropriate density according to the density control data set by said density control data setting means.

4,711,555

IMAGE FORMING APPARATUS HAVING MEANS FOR PREVENTING DAMAGE TO A PHOTOSENSITIVE MEMBER

Kenshi Toshimitsu, Kawasaki, and Hiromasa Kohayakawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 29, 1986, Ser. No. 857,033
Claims priority, application Japan, Apr. 30, 1985, 60-92563; Apr. 30, 1985, 60-93121
Int. Cl.[4] G03G *21/00, 15/06*
U.S. Cl. 355—14 R 11 Claims



1. An image forming apparatus comprising:
a drum-shaped photosensitive member having an axis of rotation;
drive means for rotating the photosensitive member about the rotation axis;
charging means for forming an electrically charged region on the surface of the photosensitive member;
latent image forming means for irradiating the charged region of the photosensitive member with a light to form an electrostatic latent image on the surface;
developing means for supplying a toner to the surface of the photosensitive member to develop the electrostatic latent image into a visible image formed of the toner;
a cleaning blade for removing the residual toner on the surface of the photosensitive member;
blade support means adapted to bringing the cleaning blade into contact with the surface of the photosensitive member;
toner adjusting means for keeping the density of the toner constant, the toner density adjusting means including sensing means for detecting the density of the toner in the developing means, and resupply means for feeding the toner to the developing means in accordance with the result of the detection by the sensing means; and
control means having an initial setting mode and an operating mode, and adapted, when the initial setting mode is selected, to actuate first the drive means, charging means, and toner density adjusting means, and thereafter to energize the developing means to form the visible image on the surface of the photosensitive member and to actuate the blade supporting means to bring the cleaning blade into contact with the surface of the photosensitive member when the toner layer reaches the location of the cleaning blade.

4,711,556

COPYING MACHINE WITH AN INTERRUPT FUNCTION

Yasuo Abuyama, Ebina, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 681,572, Dec. 13, 1984, abandoned.
This application Oct. 20, 1986, Ser. No. 920,947
Claims priority, application Japan, Dec. 20, 1983, 58-238807
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 6 Claims

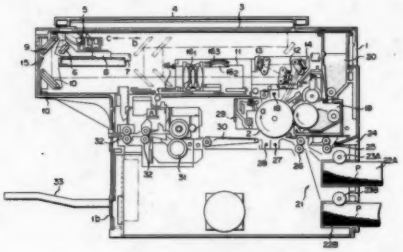
1. A copying machine comprising:
cassette holder means for detachably holding at least two

paper cassettes, each of said paper cassettes storing different size paper;

inputting means for inputting copying instructions which at least include a cassette selection instruction, into a first memory;

copying means for copying a document in accordance with the copying instructions stored in the first memory, for copying paper fed from a selected cassette;

means for temporarily saving the copying instructions which



are stored in the first memory, into a second memory in accordance with a command of an interrupt copying mode;

resetting means for resetting the copying instructions other than that of a copying paper size stored in the first memory, into standard instructions in accordance with the command of the interrupt copying mode; and

means for loading the copying instructions from the second memory into the first memory when the interrupt copying mode is completed.

4,711,557

IMAGE FORMING APPARATUS

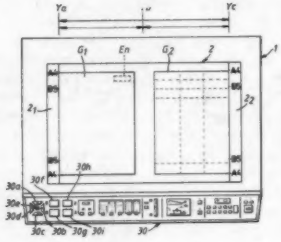
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 22, 1986, Ser. No. 899,029

Claims priority, application Japan, Sep. 6, 1985, 60-197124; Nov. 26, 1985, 60-265501

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **8 Claims**



1. An image forming apparatus comprising:

an original table on which first and second original documents are placed, said first original document having an item area, and said second original document having listed items arrayed thereon;

an image carrier;

original scanning means, movable along said original table, for optically scanning said first and second original documents placed on said original table and for forming reflected light images thereof;

means for directing light images obtained by said original scanning means onto said image carrier;

first image forming means for forming electrostatic latent images corresponding to said focused images of said first and second original documents from said directing means onto said image carrier;

second image forming means for producing visible images on an image forming medium corresponding to said electrostatic latent images;

changing means for selectively changing the position at which said directing means directs an image corresponding to said second original document on said image carrier;

image erasing means for selectively erasing selected portions of said electrostatic latent images formed by said first image forming means;

image forming medium feed-back means for feeding said image forming medium after a visible image of said first original document has been produced thereon back to said second image forming means;

memory means for storing positional data of said item area of said first original document and sizes of listed items arrayed on said second original document; and

controlling means for: (1) controlling said original scanning means, first image forming means, and second image forming means to form a visible image of said first original document on said image forming medium, (2) controlling said image forming medium feed-back means to feed said image forming medium on which the visible image of said first original document has been formed back to said second image forming means, (3) controlling said changing means to position a light image of one of said listed items arrayed on said second original document onto said image carrier, (4) controlling said image erasing means to erase the electrostatic latent image of said second original document outside of said light image of said one of said listed items, (5) controlling said original scanning means, first image forming means and second image forming means to form a visible image of said one of said listed items directed by said directing means on an area of said image forming medium corresponding to said item area, and (6) controlling said image forming medium feed-back means to feed said image forming medium having the visible image of said first original document to cause said item area of said first original document to coincide with the visible image of said listed item on said second original document formed on said image carrier.

4,711,558

COPYING APPARATUS WITH VARIABLE IMAGE MAGNIFICATION

Hiroshi Tanioka, and Toshio Honma, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 434,496, Oct. 15, 1982, abandoned.

This application Dec. 16, 1985, Ser. No. 811,308

Claims priority, application Japan, Oct. 19, 1981, 56-166649; Oct. 19, 1981, 56-166650; Oct. 19, 1981, 56-166652

Int. Cl.[4] G03G *15/04, 21/00*

U.S. Cl. 355—14 R **15 Claims**

1. A copying apparatus with variable image magnification comprising:

a light source for exposure scanning of an original;

a photosensitive member for forming an electrostatic latent image in response to the light from said original;

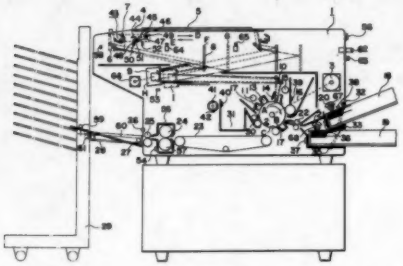
a mirror for guiding said light to said photosensitive member;

a lens for focusing said light onto said photosensitive member; and

control means for controlling the movements of said mirror and said lens independently so as to allow said mirror and lens to be moved individually to their respective positions for a desired image magnification and so as to allow one of said movements to be intitiated after the end of the other movement;

wherein said control means includes first discrimination means for discriminating whether the movement of said

mirror is normal or abnormal and second discrimination means for discriminating whether the movement of said lens is normal or abnormal, wherein said control means



allows formation of the electrostatic latent image only when said first and second discrimination means determines that the movements of both said mirror and lens are normal.

4,711,559

IMAGE FORMING APPARATUS

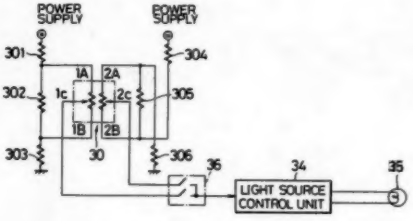
Takeshi Sambayashi, Oota, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1986, Ser. No. 925,065

Claims priority, application Japan, Oct. 31, 1985, 60-242841

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 D **8 Claims**



1. An image forming apparatus for forming electrostatic latent images on an image bearing member by irradiating images from a light souce and developing the electrostatic latent images to form the images on a recording body, which comprises:

first development means for normally developing the electrostatic latent image;

second development means for inversely developing the electrostatic latent image;

mode selecting means for selecting a first mode in which said first development means is used or a second mode in which said second development means is used; and

image density level changing means (**30,40,50**) for controlling the density levels of images to a same level by a same manipulation regardless the development mode selected by said mode selecting means.

4,711,560

IMAGE PROCESSING APPARATUS

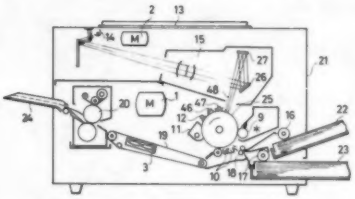
Masao Hosaka, Sagamihara, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 751,424, Jul. 3, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,626

Claims priority, application Japan, Jul. 10, 1904, 59-143476; Jul. 10, 1984, 59-143477; Jul. 10, 1984, 59-143478

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 C **17 Claims**



1. An image processing apparatus comprising:

image processing means for forming an image;

means for displaying information relating to image formations;

a memory medium storing a program for controlling said image processing means, said memory medium being removably provided in said image processing apparatus; and

control means for reading out the program stored in said memory medium and determining a function of said image processing apparatus in accordance with the program;

wherein said display means displays information associated with the determined image processing function and said control means includes a memory storing a monitor program that controls the program read out from said memory medium, said memory constantly storing the monitor program.

4,711,561

TONER RECOVERY DEVICE

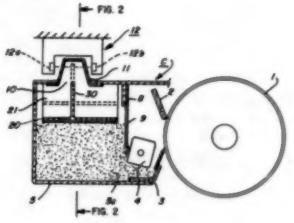
Ryoichi Tsuruoka, Hongo Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Oct. 15, 1986, Ser. No. 919,732

Claims priority, application Japan, Oct. 21, 1985, 60-233411

Int. Cl.[4] G03G *15/00, 21/00*

U.S. Cl. 355—3 R **16 Claims**



1. A toner recovering device for recovering residual toner from an image bearing member comprising a toner recovering box adapted for containing recovered toner therein and having a transparent or translucent window at the upper portion thereof, said recovery box containing a float member vertically movable to float on top of toner recovered in said recovery box inr esponse to the amount of toner recovered in said recovery box, said float member having fixed to its top a flag member at a position corresponding to said window so that as the

level of toner increases said float member rises corresponding to the quantity of recovered toner and said flag member may be viewed in said window providing an indication of the amount of toner recovered in the toner recovery box.

4,711,562

IMAGE-FORMING APPARATUS

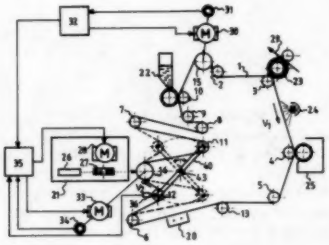
Lambertus A. Pothast, Boxmeer; Johannes P. Grootentraast, Tegelen, and Joannes F. J. Verdonschot, Nederweert, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Dec. 18, 1986, Ser. No. 944,233

Claims priority, application Netherlands, Dec. 24, 1985, 8503559

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—16 **5 Claims**



1. An image-forming apparatus comprising:

(a) a belt-like medium on which an image can be formed;

(b) a plurality of processing stations for forming the image on the medium;

(c) a first system for conveying the medium past a first processing station, the first system having a plurality of mutually parallel, freely rotatable rollers and a drive device for driving the medium at a first constant speed;

(d) at least a second system for conveying the medium past a second processing station, the second system having a plurality of mutually parallel, freely rotatable rollers and a drive device for driving the medium at a second speed which at least temporarily differs from the first speed; and

(e) wherein two rollers of the second system, one of which is situated in front of and one after the second processing station when considered in the direction of medium movement, are interconnected and are secured to a rotatable lever mechanism, the axis of rotation of which is parallel to and equidistant from the two rollers and is situated in the plane defined by the two rollers.

4,711,563

PORTABLE COLLAPSIBLE DARKROOM

Bennett D. Lass, 85 Harman Rd., Edison, N.J. 08837

Filed Feb. 11, 1987, Ser. No. 13,439

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—21 **9 Claims**

1. A portable collapsible darkroom assembly for enclosing a photographic enlarger, comprising:

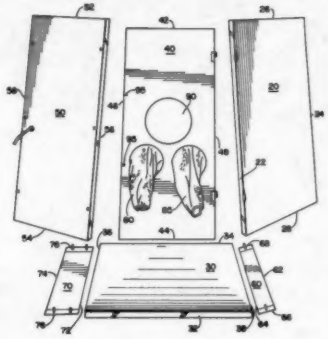
left and right parallel side panels, each having a top, bottom, front and rear edge;

a back panel removably secured to the rear edge of each of said left and right side panels;

a door having a length slightly less than the length of said left and right side panels, said door being removably and hingedly attached to one of said left and right side panels and latchable to the front edge of the other of said left and right side panels for providing access by an operator to the inside of said darkroom assembly;

top and bottom front panels removably attached to top and bottom portions of the front edge of each of said left and right side panels, respectively;

a top panel removably attached to the top edge of each of said left, right, back and top front panels, thereby creating a light-tight enclosure when said door is latched to the front edge of the other of said left and right side panels; and



first and second sleeved arm ports provided on said door for providing access by an operator to the inside of the darkroom assembly.

4,711,564

MECHANISM FOR THE DRIVE OF ACTUATION ELEMENTS MOVABLE IN SEALED REGIONS OF NON-MECHANICAL PRINTER OR COPIER MEANS

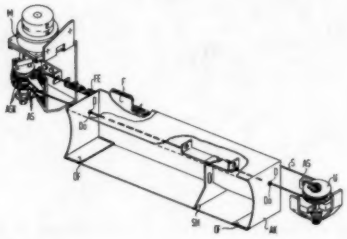
Hubert Mugrauer, Poering; Ernst Puritscher, Unterhaching, and Franz Wittmann, Isen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 3, 1986, Ser. No. 937,490

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1985, 3542733

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—30 **11 Claims**



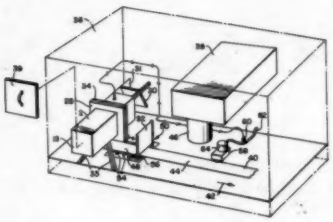
8. A mechanism for the drive of actuation elements movable in sealed regions of a printer or copier means with the assistance of a motor-driven cable roller arranged outside of a sealed region wrapper via a traction cable secured to said actuation element, comprising the improvement that said cable roller is composed of a thermoplastic synthetic and includes guide grooves on its generated surface for said traction cable, which is composed of plastic-clad steel, said guide grooves proceeding in a spiral, said cable roller being arranged on a stationary rotational axis via a thread, said rotational axis thread having the same characteristic as said guide grooves in terms of direction and pitch, and said traction cable being fixed to the generated surface of said cable roller via a clamp element, whereby during the movement of said cable roller, said traction cable is

conducted through seals of said sealed region at a relatively constant angle on a substantially straight line.

4,711,565
ADD-ON ATTACHMENT FOR HIGH-SPEED PHOTOGRAPHIC PRINTER

Thomas F. Franchina, Johnson City, N.Y.; Gunnar G. Gudmundson, Longmeadow, and John R. Reuss, Westfield, both of Mass., assignors to 2610 PGA Partnership, San Francisco, Calif.

Continuation of Ser. No. 843,802, Mar. 27, 1986, abandoned, which is a continuation of Ser. No. 478,612, Mar. 24, 1983, abandoned. This application Feb. 6, 1987, Ser. No. 15,500
Int. Cl.[4] G03B 27/32
U.S. Cl. 355—39 **12 Claims**



1. Apparatus for use in conjunction with a high-speed photoprinter having a dark cabinet structure with an external opening in one surface thereof and a primary projection system disposed in the dark cabinet, the primary projection system periodically operating to project primary images onto a photosensitive medium disposed in the photoprinter, said apparatus comprising;

projection means for projecting secondary images onto the photosensitive medium in response to a control signal;

control means for supplying said projection means with said control signal, said control means including a circuit means which determines when each primary image is projected onto the photosensitive medium by the primary projection system and which generates said control signal in response to each projection of the primary image such that synchronization is achieved between the operation of said projection means and the operation of the primary projection system to establish a one-to-one correspondence between each primary image projected onto the photosensitive medium and each secondary image projected onto the photosensitive medium; and

a support means for retaining said projection means in a predetermined orientation relative to the primary projection system in the photoprinter such that said secondary images projected from said projection means are positioned on the photosensitive medium in the photoprinter in fixed relationship to the primary images, said support means including a support structure having an add-on configuration adapted to releasably secure said projection means in the external opening of the photoprinter dark cabinet to provide access to said projection means from outside the dark cabinet.

4,711,566
APPARATUS FOR ELECTRONIC SCANNING AND MICROFILMING OF DOCUMENTS

Bruce M. Evans, Columbia Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

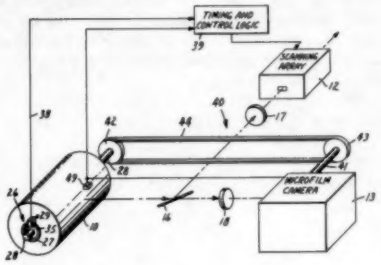
Filed Oct. 31, 1985, Ser. No. 793,674
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—41 **2 Claims**

1. Apparatus for storing documents on microfilm and for obtaining digital signals representative of the image present on a document for storage in a memory, including:

a document transport means providing a movable surface for receiving a document;

a light responsive electronic scanning array;

a microfilm camera; and

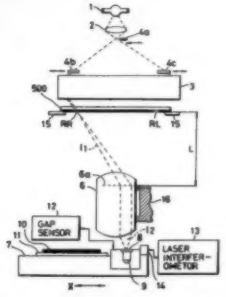


optical means for exposing a document to light when carried by said document transport means, said optical means including a beam splitter mirror for directing the light reflected from the document to said light responsive electronic scanning means for the generation of digital signals representative of the image carried on the document and to said microfilm camera for exposure of film in accordance with the light directed to said microfilm camera.

4,711,567
EXPOSURE APPARATUS

Akikazu Tanimoto, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 800,094, Nov. 20, 1985, Pat. No. 4,629,313. This application Aug. 18, 1986, Ser. No. 897,644
Claims priority, application Japan, Oct. 22, 1982, 57-184443; Nov. 22, 1982, 57-204856; Mar. 7, 1983, 58-35737; Jul. 11, 1983, 58-125889; Jul. 22, 1983, 58-133691
Int. Cl.[4] G03B 27/42
U.S. Cl. 355—53 **23 Claims**



1. An exposure apparatus for producing semiconductor devices comprising:

(a) a mask in which a plurality of sets of a first mark and a second mark are placed at predetermined positions, the first marks extending in one direction and the second marks extending in a direction at nearly right angles to said one direction;

(b) means for illuminating said mask;

(c) an optical system for forming on a given plane an image of each of a plurality of said first and second marks of said mask illuminated by said illuminating means;

(d) light intensity detecting means having at least one first detection surface and at least one second detection surface

for detecting the images of the plurality of sets of said first mark and said second mark, said at least one first detection surface extending in a determined direction on a rectangular coordinate system intersecting the optical axis of said optical system at nearly right angles, said at least one second detection surface extending in the other direction at nearly right angles to said determined direction, said light intensity detecting means detecting the intensity of light incident on said at least one first detection surface and said at least one second detection surface and producing light intensity signals;

(e) means for moving said at least one first detection surface and said at least one second detection surface on said given plane; and

(f) means for detecting optical characteristics of said optical system in response to said light intensity signals.

4,711,568

EXPOSURE APPARATUS

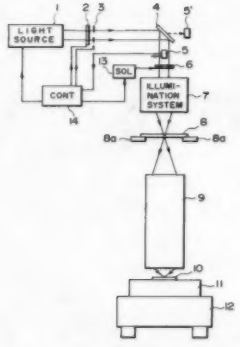
Makoto Torigoe, Kawasaki; Akiyoshi Suzuki, Tokyo, and Terumasa Sakai, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1986, Ser. No. 836,630

Claims priority, application Japan, Mar. 6, 1985, 60-44206

Int. Cl.[4] G03B *27/74, 27/80*

U.S. Cl. 355—68 **9 Claims**



1. An exposure apparatus for exposing a first object to light passed through a second object having a pattern to transfer the pattern of the second object onto the first object, said apparatus comprising:

an intermittently emitting type light source for intermittently emitting a pulse of light to intermittently irradiate the second object with the pulse of light;

first means operative on said light source to cause the same to emit one or more pulses of light for the detection of the quantity of light from said light source;

means for detecting the quantity of light of said one or more pulses from said light source; and

second means responsive to said detecting means to adjust the quantity of light to be incident on the first object, in accordance with the detection by said detecting means.

4,711,569

ORIGINAL ILLUMINATION DEVICE WITH AN AUTOMATIC ILLUMINATION CONTROL

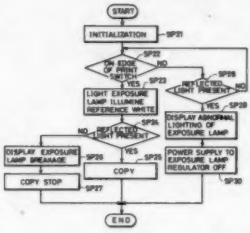
Kadotaro Nishimori; Keiji Yoshida, and Tadashi Ohira, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1986, Ser. No. 881,460

Claims priority, application Japan, Jul. 5, 1985, 60-148968

Int. Cl.[4] G03B *27/72*

U.S. Cl. 355—69 **36 Claims**



1. An original illumination device comprising

illuminating means including a light source for illuminating an original;

power supply means for supplying power to said light source;

automatic illumination control means including light receiving means disposed in a light path through which light from the original illuminated by said light source passes, and outputting a signal corresponding to the amount of light received, for controlling said power supply means to accommodate the amount of radiation of said light source responsive to the signal from said light receiving means;

malfunction determining means for determining a malfunction concerned with said light source responsive to a signal from said light receiving means at a prescribed time; and

malfunction control means for controlling power supply to said light source to be stopped in response to the determination of malfunction by said malfunction determining means.

4,711,570

VACUUM CONTACT EXPOSURE APPARATUS

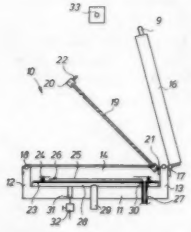
Petrus R. Nelen, Essen, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Dec. 10, 1986, Ser. No. 940,067

Claims priority, application European Pat. Off., Dec. 17, 1985, 85202091.6

Int. Cl.[4] G03B *27/20*

U.S. Cl. 355—91 **9 Claims**



1. A vacuum contact exposure apparatus for contact-exposing a light-sensitive photographic sheet to at least one other

sheet, such apparatus comprising a flexible blanket with a peripheral sealing means, a transparent plate for positioning against said sealing means to form with said blanket a contact exposure space enclosing said sheets, and means for evacuating air from such exposure space to promote intimate contact between said sheets and between the sheets and said plate preparatory to exposure through said plate, characterised in that the apparatus incorporates a housing for air-tightly enclosing the plate-blanket assembly prior to such exposure step, aspirating means associated with said housing and by operation of which the pressure on the exterior of said plate and blanket can be reduced so that it is at sub-atmospheric during said evacuation of air from said exposure space, and means by operation of which air can be admitted into said housing while said contact exposure space remains evacuated; said housing being openable to allow contact exposure then to be effected through said transparent plate.

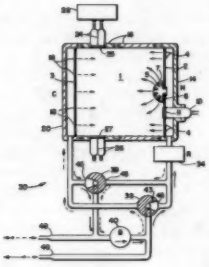
4,711,571
RADIANT EMISSION AND ABSORPTION MULTIGAS ANALYZER

Mark Schuman, 101 G St. SW. #516, Washington, D.C. 20024

Continuation of Ser. No. 818,919, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 675,474, Nov. 29, 1984, abandoned, which is a continuation of Ser. No. 416,677, Sep. 10, 1982, abandoned. This application Mar. 16, 1987, Ser. No. 28,026

Int. Cl.[4] G01J *3/443*; G01N *21/62*

U.S. Cl. 356—311 **156 Claims**



1. A radiant emission and absorption gas analyzer comprising a cavity reflective to electromagnetic radiation, said cavity including first and second wall surfaces pervious to fluid flow through said surfaces, said surfaces each containing one or more ports through which fluid can pass into and back out of the cavity, means for injecting fluid at a first average temperature into the cavity through said first surface while withdrawing fluid from the cavity through said second surface, then injecting fluid at a second average temperature into the cavity through said second surface while withdrawing fluid from the cavity through said first surface, means for cyclically repeating the sequence of said injections at approximately said first and second average temperatures, and further including detector means responsive to the cyclical variation in spectral electromagnetic radiance in the cavity resulting from the presence of a substance of interest in the fluid and the cyclical injections of fluid at approximately said first and second average temperatures into the cavity; the ports of said first surface being shaped and located on said first surface such that most of the first surface is pervious to fluid flow, said first surface constituting a significant fraction of the internal wall area of the cavity and being reflective to electromagnetic radiation in the cavity; said injecting means including means for maintaining a substantially constant fluid pressure in the cavity during the cycle.

4,711,572
METHOD AND ARRANGEMENT FOR MULTIELEMENT ANALYSE

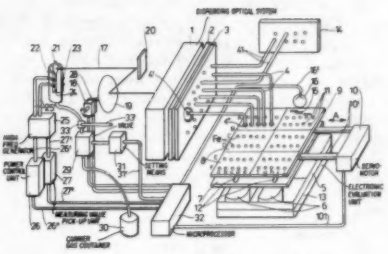
Winfried Quillfeldt; Bernd Naumann, both of Jena-Lobeda, and Helmut Becker-Ross, Berlin, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Dec. 10, 1984, Ser. No. 680,220

Claims priority, application German Democratic Rep., Dec. 1, 1983, 2573606; Mar. 1, 1984, 2604567

Int. Cl.[4] G01J *3/443*

U.S. Cl. 356—311 **7 Claims**



1. A spectrometer arrangement for simultaneous analyse of a plurality of chemical elements comprising an excitation source for exciting a sample material to emit a radiation,

reflector means,

an optical dispersing means,

said reflector means being for directing said radiation upon said optical dispersing means, said optical dispersing means producing a plurality of spectral lines in dependence of the sample material to be analyzed in a first plane,

a first optical mask being associated with said optical dispersing means in a second plane and including as many exit slits in said second plane as there are spectral lines,

said first plane and said second plane being substantially coincident,

a plurality of light cables having each a light entry face and a light exit face,

a means for mounting the light entry faces of said light cables in a third plane,

said third plane being in narrow spaced and parallel relation to said second plane subsequent to said second plane,

said light entry faces being optically connected via said slits to a respective one of said spectral lines, if any,

a plug-in unit being provided with a plurality of plug-in holes for insertion of the light-exit faces of said light cables,

said plug-in unit being subdivided into a plurality of sections of substantially equal size,

a second mask being arranged subsequent to said plug-in unit at a narrow distance to the latter,

said plug-in holes in said plug-in unit being substantially arranged in lines and columns being at right angles to one another,

said second mask including as many slits as there are sections in said plug-in unit, said slits being aligned in parallel to said columns of plug-in holes and an right angles to said lines, each slit being associated to a respective section of said plug-in unit,

an array of photodetectors being constituted of as many photo-detectors as there are sections in said plug-in unit,

said array of photodetectors being arranged in a parallel plane subsequent to said second mask at a narrow space to the latter, said light exit faces of said light cables being optically connected via said plug-in unit and said

second mask to respective photodetectors of said array of photodetectors,

means for displacing said plug-in unit in a fourth plane defined by said lines and columns and in directions right angles to said columns, detection means for identifying the position of a column of plug-in holes relative to the photodetectors,

said detection means being provided at the edge portion of said plug-in unit adjacent said columns, a microprocessor,

a first connection means for connecting said displacement means to said microprocessor,

a second connection means for connecting said detection means to said microprocessor, an evaluation unit being connected to the photodetector outputs,

said evaluation unit serving for evaluating the photodetector output signals, if any, indicative of a chemical matter contained in said sample material,

excitation parameter adjustment means, being operatively connected to the excitation source and to said microprocessor,

said microprocessor setting at least one excitation parameter on information from said detection means for a respective column of plug-in holes relative to the photodetectors.

4,711,573

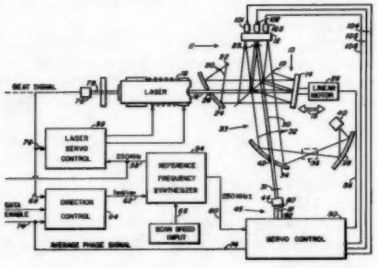
DYNAMIC MIRROR ALIGNMENT CONTROL

Geert Wijntjes, Belmont, and Michael Hercher, Marblehead, both of Mass., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 472,771, Mar. 5, 1983, abandoned. This application Dec. 12, 1986, Ser. No. 940,196

Int. Cl.[4] G01J *3/45*

U.S. Cl. 356—346 **12 Claims**



1. A closed loop servo control for dynamically aligning mirrors of an interferometer used for spectroscopic measurements, comprising:

means for producing a laser beam having a plurality of light frequencies which are heterodyned through the interferometer to obtain a continuous and constant intensity modulation of a select frequency usable to indicate the distance between the surface of a first mirror in the interferometer and a reflected image of the surface of a second mirror in the interferometer;

detector means for detecting said continuous intensity modulation in said laser beam to obtain a plurality of electrical signals each having a frequency characteristic of said intensity modulation frequency and of a modified intensity modulation when either said first or second mirror is moved relative to the other at selected locations in a cross section of said laser beam;

control means for comparing the phase of signal frequency of each of the plurality of electrical signals with the average of their phase, to obtain a plurality of correction signals, each of said correction signals indicating a correction in distance required between a portion of the surface of the first mirror and a corresponding portion of the image of the surface of the second mirror to bring said first mirror and said image into parallel alignment; and

a plurality of adjusting means mounting one of said mirrors and responsive to said correction signals for changing the alignment between said controllably separating the surface of said first mirror and the image of the surface of said second mirror.

4,711,574

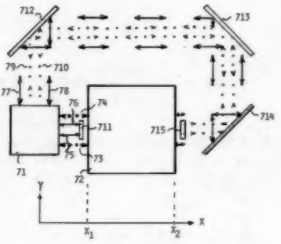
MINIMUM DEADPATH INTERFEROMETER AND DILATOMETER

Richard R. Baldwin, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 27, 1984, Ser. No. 604,702

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **4 Claims**



1. A minimum deadpath interferometer comprising:

a light source;

at least one movable element including a movable first reflecting surface attached to a first side of a movable stage in a lithography apparatus;

optical means having a plurality of elements for producing from light from the light source a first beam of light and a second beam of light, for directing the first beam to reflect off of the first reflecting surface and then combine with the second beam of light to produce an output beam having a common output direction that is independent of small rotations of the first reflecting surface and of each element of the optical means, and for directing the first and second beams along paths that are common mode except for a minimal deadpath that includes the first reflecting element and that is necessary to allow movement of said first movable element;

a second reflecting element, said second beam reflecting off of the second reflecting element before the second beam is combined with the first beam in the output beam, such that the interference effects in the output beam are responsive only to the relative motion of the first surface relative to the second surface, whereby these interference effects are insensitive to equal translations and rotations of the first and second surfaces;

said second reflecting surface being as close to the first surface as is practicable without interfering with the movement of the movable stage, whereby the deadpath between the first and second reflecting elements is minimized and whereby the motion of the first surface relative to the second surface can be detected;

a third reflecting surface and a fourth reflecting surface;

second beam directing means for directing the second beam from the optical means to the third reflecting surface and back to the optical means and for directing the first beam from the optical means to the fourth reflecting surface and back to the optical means;

said third reflecting surface being attached to a second side of the movable stage opposite to its first side and said fourth reflecting surface being as close to the third reflecting means as is practicable without restricting motion of the wafer stage, whereby the deadpath between the third

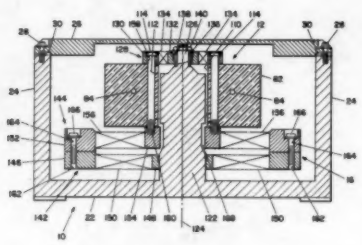
and fourth reflecting surfaces is minimized and whereby the interference effects in the output beam are insensitive to thermal expansion of the stage in the direction from the first side to the second side.

4,711,575

NON-PENDULOUS COUNTER-BALANCED DITHER MECHANISM FOR LASER GYRO

Alfred L. Butler, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 1, 1982, Ser. No. 364,328
Int. Cl.[4] G01B *9/02*; H01S *3/083*
U.S. Cl. 356—350 **9 Claims**



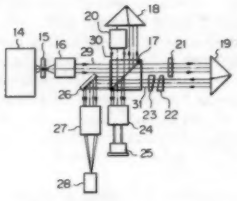
1. A laser gyro assembly, comprising:
a ring laser having a sensing axis;
a case for housing said ring laser, said case having a base with a center post disposed normal thereto and coaxially with said sensing axis;
said ring laser having an aperture therethrough disposed within said case with said center post passing through said aperture;
first spring means connected between said ring laser and said center post to mount said ring laser about said sensing axis to said case;
a counterweight;
second spring means connected between said counterweight and said center post to mount said counterweight to said case;
third spring means mounting said ring laser about said sensing axis to said counterweight; and
said first spring means being disposed along said sensing axis on the opposite side of said ring laser from said second and third spring means to support said ring laser against pendulous rotation from forces normal to said sensing axis.

4,711,576

WAVE FRONT ABERRATION MEASURING APPARATUS

Mikichi Ban, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,596
Claims priority, application Japan, Feb. 4, 1985, 60-19443
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—353 **15 Claims**



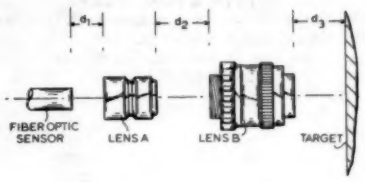
1. A wave front aberration measuring apparatus comprising:
beam splitting means for splitting a light beam to be measured into a first beam and a second beam;
first converting means for deflecting a travel direction of said first beam by 180° and laterally displacing said first beam, said first converting means being able to be displaced along said travel direction for controlling the optical path length of said first beam;
second converting means for deflecting a travel direction of said second beam by 180° and laterally displacing said second beam;
a beam expander otpical system disposed in the optical path of one of said first and second beams for forming an expanded beam from said one beam to obtain a reference wave front;
interference fringe forming means for superposing the first and second beams guided by said first and second converting means to form interference fringes; and
interference fringe observing means for observing the state of the interference fringes obtained by said expanded beam and the other beam of said first and second beam to measure the state of wave front of the light beam to be measured, from the state of said interference fringes.

4,711,577

OPTICAL CONFIGURATION OF FIBER OPTIC SENSOR FOR SYMMETRIC DYNAMIC RESPONSE ABOUT THE OPTICAL NULL

Gregory Hull-Allen, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Continuation of Ser. No. 709,560, Mar. 8, 1985, abandoned. This application May 7, 1987, Ser. No. 49,005
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—373 **1 Claim**



1. A method of determining the displacement of a fiber optic sensor from a target in which a first lens is spaced from the target at a first distance and a second lens is spaced from said target at a second distance which provides the greatest intensity response at said first lens to achieve the largest response slope value for a given distance and thereafter spacing said first lens from said second lens to provide symmetrical slope values of response.

4,711,578

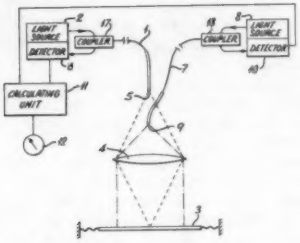
OPTICAL DISPLACEMENT SENSORS

Jean-Claude A. Chaimowicz, London, England, assignor to National Research Development Corporation, London, England

Filed Jun. 13, 1985, Ser. No. 744,383
Claims priority, application United Kingdom, Jun. 14, 1984, 8415128
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—375 **4 Claims**

1. An optical displacement sensor comprising a reflector the displacement of which is to be measured, a first monochromatic radiation source coupled to a single optical fibre one end of which is directed onto the reflector so as to illuminate the reflector with radiation from the source, signal detector means for detecting and measuring radiation reflected back from the reflector to said one end and along said optical fibre and arranged so that the amount of the reflected radiation detected is a function of the position of the reflector, a further monochro-

matic radiation source, an optical path from said further monochromatic radiation source and arranged to enable radiation from said further source to illuminate said reflector, and reference detector means for detecting and measuring radiation



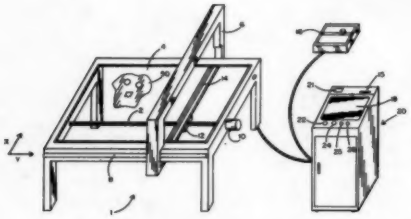
from said further monochromatic radiation source reflected back from the reflector, said optical path being arranged so that the amount of the reflected radiation detected in the reference detector means is independent of the position of the reflector.

4,711,579

SYSTEM FOR AUTOMATICALLY INSPECTING A FLAT WORKPIECE FOR HOLES

Blair E. Wilkinson, El Toro, Calif., assignor to H. Fred Johnston and Carl Grosso, both of Santa Ana, Calif.

Filed Aug. 12, 1986, Ser. No. 895,644
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—375 **20 Claims**



1. A system for automatically inspecting a workpiece for holes formed therein, said system comprising;

an inspection table having a transparent surface upon which the workpiece is to be laid;

light source means;

optical detector means; and

means movable across said table in a first direction and retaining said light source means and said optical detector means in alignment with one another above and below said transparent table surface;

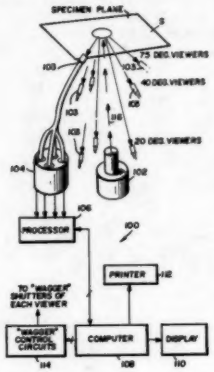
said optical detector means extending across said table in a second, perpendicular direction relative to said first direction and being responsive to optical signals received from said light source means through said transparent table surface for providing an indication, depending upon the position of said movable retaining means, of the location in the workpiece of holes formed therein through which said optical signals are transmitted.

4,711,580

MODELING PROPERTIES OF FLAKE FINISHES USING DIRECTIONAL RESOLUTION AND STATISTICAL FLAKE ORIENTATION DISTRIBUTION FUNCTION

William H. Venable, Falls Church, Va., assignor to Hunter Associates Laboratory, Inc., Reston, Va.

Filed Jan. 28, 1985, Ser. No. 695,594
Int. Cl.[4] G01J *3/50, 3/51*; G01N *21/27*; G06F *15/46*
U.S. Cl. 356—406 **32 Claims**



1. A method for characterizing a surface painted with a paint of the type having a plurality of nearly flat reflective flakes embedded therein, said method comprising the steps of:

(1) directing a beam of light toward said surface;

(2) independently receiving portions of said beam of light reflected and/or scattered by said surface in a plurality of different directions;

(3) determining the spectral content of the light reflected by said surface in each of said plurality of different directions;

(4) in response to said determined spectral contents, characterizing the distribution of light reflected by said embedded flakes in directions other than said plurality of directions according to a statistical method describing the orientation of said flakes; and

(5) producing and outputting electrical signals indicating said characterization.

4,711,581

ROTARY PROCESSOR FOR PLASTIC AND POLYMERIC MATERIALS PROVIDING SURGE COMPENSATION

Pradip S. Mehta, Corpus Christi, Tex.; Lefteris N. Valsamis, Stratford, and Gary S. Donoian, Naugatuck, both of Conn., assignors to Farrel Corporation, Ansonia, Conn.

Filed Mar. 4, 1987, Ser. No. 21,412
Int. Cl.[4] B01F *7/10*
U.S. Cl. 366—99 **26 Claims**

1. In a rotary processor having a rotor carrying a plurality of channels each encircling an axis and stationary means providing a coaxial closure cooperatively arranged with the channels for providing a plurality of enclosed processing passages, a system for reducing fluctuations in the mass flow and pressure of plastic and polymeric materials comprising:

said rotor channels and closure surface defining at least one stabilizing passage and at least one metering passage;

means defining a feed path leading into said stabilizing passage for feeding into said stabilizing passage a flow of such material subject to such fluctuations;

means defining a first material transfer passage leading from said stabilizing passage to an entrance into said metering passage;

means defining a second material transfer passage leading from an exit from said metering passage back into said stabilizing passage;

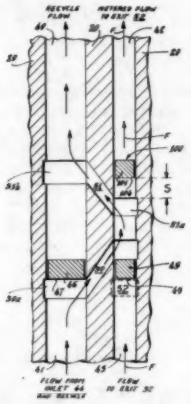
said first material transfer passage communicating with said stabilizing passage at a location downstream from the location where said feed path communicates with said stabilizing passage;

channel blocking means in said stabilizing passage downstream from said first material transfer passage and being operatively associated with said first material transfer passage for causing the material carried by said stabilizing passage to be transferred from said stabilizing passage through said first material transfer passage into said metering passage;

said exit being located downstream from said entrance;

said second material transfer passage communicating with said stabilizing passage at a location downstream from said channel blocking means;

an adjustable throttling element in said metering channel downstream from said exit for partially blocking said



metering passage for allowing a metered flow of material to be carried past said throttling element for providing a metered flow of material in said metering passage downstream from said throttling element;

said throttling element being associated with said exit for causing excess material in said metering passage exceeding said metered flow to be transferred back through said second material transfer passage into said stabilizing passage for recycling;

means defining a discharge outlet from said metering passage downstream from said throttling element; and

second channel blocking means in said metering passage operatively associated with said dischare outlet for causing said metered flow to leave said metering passage through said discharge outlet wherein the fluctuations in mass flow and pressure are substantially reduced or practically eliminated.

4,711,582

ROTARY MIXING OF TWO COMPONENT RESINS IN DISPOSABLE PLASTIC BAG

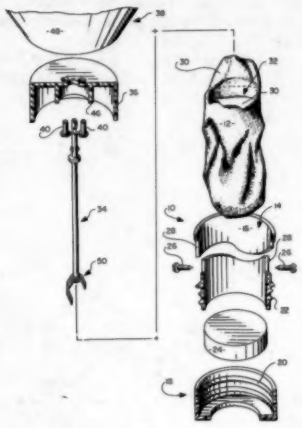
Richard B. Kennedy, 519 Branchville Rd., Ridgefield, Conn. 06877

Filed Nov. 7, 1986, Ser. No. 928,058
Int. Cl.[4] B01F *9/00*
U.S. Cl. 366—279 **19 Claims**

1. An apparatus for mixing and agitating a liquid, the apparatus comprising:

a rigid outer receptacle defining an interior and having an open top, the receptacle is provided with interior sidewalls that have an inwardly sloping configuration; and

a flexible and disposable liquid resistant bag having an open top, a closed bottom and sidewalls, the bag is adapted and constructed to line the interior sidewalls of the outer receptacle; when liquid to be mixed is deposited into the bag, the bag expands contacting the sidewalls of the outer



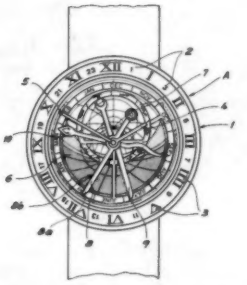
receptacle, a mixing element can then be placed through the open tops of the receptacle and the bag for mixing liquid contained in the bag.

4,711,583

ASTRONOMICAL WRIST-WATCH

Ludwig Oechslin, Lucerne; Urs Giger, Solothurn, and Jörg Spöring, Lucerne, all of Switzerland, assignors to Ulysse Nardin S.A., Le Locle, Switzerland

PCT No. PCT/CH85/00106, § 371 Date Nov. 5, 1986, § 102(e) Date Nov. 5, 1986, PCT Pub. No. WO86/05288, PCT Pub. Date Sep. 12, 1986
PCT Filed Jul. 1, 1985, Ser. No. 932,546
Int. Cl.[4] G04B *19/26*
U.S. Cl. 368—16 **15 Claims**



1. An astronomical watch comprising an epicyclic train of gearing and a temporal reference means having a mechanical output which is coupled, via said epicyclic train of gearing, to at least one astronomical magnitude indicator, said epicyclic train of gearing including gear means for each astronomical magnitude indicator, a ring gear, a driving central wheel, and a rotatable planetary wheel carrier, the ring gear and the driving central wheel of said train of gearing being coupled to said temporal reference while said planetary wheel carrier is connected to a local time indicator, and said gear means comprising multiple rotary components that are mounted on the planetary wheel carrier of the train and that have a predetermined reduction ratio.

4,711,584

MOVEMENT OF ELECTRONIC WATCH OF ANALOG DISPLAY TYPE

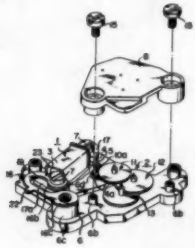
Masayoshi Tanazawa, Tokyo; Masaru Shoji, Saitama, and Wataru Yamada, Tokyo, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

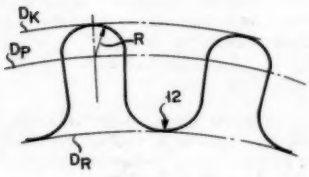
Filed May 19, 1986, Ser. No. 865,189

Claims priority, application Japan, Jun. 24, 1985, 60-94371[U]

Int. Cl.⁴ F04C *23/02*

U.S. Cl. 368—88 **14 Claims**





1. A movement of an electronic watch of analog display type comprising:

a baseplate made of a synthetic resin;

a step motor mounted on said baseplate and including a rotor, a stator and a coil;

a bearing plate made of a synthetic resin and facing and spaced apart at a predetermined distance from said synthetic resin baseplate; and

a gear train consisting of a plurality of gears including gears journaled between said baseplate and bearing plate to transmit the rotation of said rotor of said motor to hands; said gears of said gear train being made of synthetic resin, the teeth of said gears being formed in an arc, and the radius of a top of the teeth of each of said gears is at least 0.4 times that of a module M defined by the relationship M=diameter of pitch line/divided by number of teeth.

4,711,585

CUEING AID FOR PRENATAL BREATHING CONTROL

Meredith L. Fresquez; Chris J. Fresquez, both of 1711 Wisteria La., Brea, Calif. 92621, and Daniel A. Porter, 1706 Fairgreen Dr., Fullerton, Calif. 92633

Filed Feb. 24, 1986, Ser. No. 832,414

Int. Cl.⁴ G04F *8/00*; G04C *21/00*

U.S. Cl. 368—109 **1 Claim**

1. An apparatus for producing sensory cues for use by an expectant mother to synchronize her breathing to comprising:

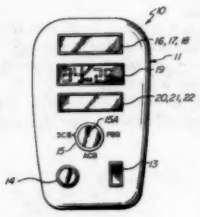
(a) first electrically energizable cueing means for producing a first sensory cue;

(b) second electrically energizable cueing means for producing a second sensory cue;

(c) electronic sequencer means for cyclically and alternately energizing said first and second cueing means, said sequencer means being capable of producing a plurality of manually selectable time patterns of cyclical and alternate energization of said first and second cueing means, at least one of which said time patterns having a duty cycle which varies automatically in a pre-determined fashion;

(d) means for manually selecting a desired one of said plurality of patterns;

(e) means for manually starting and stopping said sequence of alternate energization of said first and second cueing means; and



(f) counter means for measuring and displaying the elapsed time between successive starting actuations of said starting and stopping means, said counter means including a counter responsive to first and successive odd actuations of said manual starting and stopping means in

(i) displaying an accumulated count proportional to elapsed time,

(ii) clearing said counter to zero, and

(iii) accumulating a new count proportional to elapsed time.

4,711,586

CLOCK

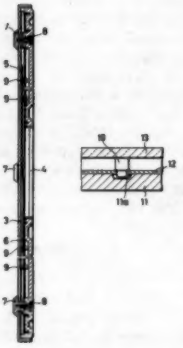
Hiroyuki Kizawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,373

Claims priority, application Japan, Jun. 19, 1985, 60-92484[U]; Jun. 19, 1985, 60-92485[U]

Int. Cl.⁴ G04B *19/06*

U.S. Cl. 368—232 **20 Claims**



1. In a clock comprising a capsule having a timepiece movement therein, an install plate for firmly supporting said capsule disposed thereon, a dial having a front face and time reference members on the front face, the dial being disposed in front of said install plate, a transparent front cover having a back face and being disposed in front of said dial to define a gap between the back face of the transparent front cover and the front face of the dial, and hands disposed in the gap and driven by said timepiece movement to move relative to the time reference members to indicate time; the improvement wherein said time reference members have a height substantially corresponding

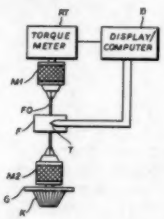
to said gap between said dial and said front cover so as to act as spacers for maintaining said gap.

4,711,587

METHOD OF AND APPARATUS FOR MEASURING THE SOFTENING POINT OF A VITREOUS SPECIMEN

Giuseppe Cocito, S. Giusto Can.se, Italy, assignor to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jul. 21, 1986, Ser. No. 887,275
Claims priority, application Italy, Jul. 24, 1985, 67676 A/85
Int. Cl.[4] G01N *25/04*
U.S. Cl. 374—16 **6 Claims**



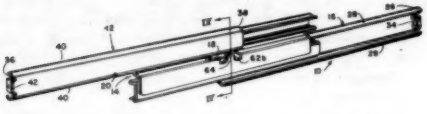
1. A method of determining the softening point of a vitreous specimen, comprising the steps of:
(a) imparting torsion to said specimen;
(b) heating a portion of said specimen over a temperature range including the softening point of the specimen and measuring the temperature to which said specimen is heated;
(c) measuring torque developed by said specimen, said torque varying with the temperature to which said specimen is heated as a function of viscosity changes in said specimen; and;
(d) obtaining from the measured torque with respect to temperature, the softening point in the temperature interval in which said viscosity drops.

4,711,588

SEQUENTIAL DRAWER SLIDE

Gene R. Clement, Grandville, Mich., assignor to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Aug. 18, 1986, Ser. No. 897,779
Int. Cl.[4] A47B *88/04*; F16C *29/04*
U.S. Cl. 384—18 **25 Claims**



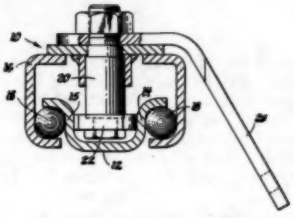
1. A sequential drawer slide comprising:
a cabinet slide member;
an intermediate slide member mounted for linear movement with respect to said cabinet slide member between extended and retracted positions;
a drawer slide member mounted for linear movement with respect to said intermediate slide member between extended and retracted positions; and
sequencing means for sequencing the operation of said slide members so that only one of said cabinet and drawer slide members is permitted to move with respect to said intermediate slide member at any given position of said slide members, said sequencing means including a control lever member shiftably supported by said intermediate slide member between first and second positions, said sequencing means further including first and second engagement means on said drawer and cabinet slide members, respectively, said control lever member coacting with said first engagement means when in the first position and with said second engagement means when in the second position to aid in interlocking said intermediate slide member with the one of said cabinet and drawer slide members carrying the coacting engagement means, said control lever member being shiftable between the first and second positions when said intermediate rail is in its extended position and said drawer rail is in its retracted position.

4,711,589

MANUAL SEAT ADJUSTER WITH CAM LOCK

Neil G. Goodbred, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1986, Ser. No. 846,106
Int. Cl.[4] A47C *1/00*; F16C *29/12*; F16M *13/00*
U.S. Cl. 384—34 **13 Claims**



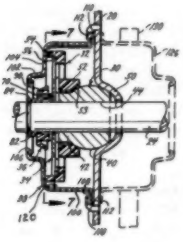
1. A vehicle seat slide structure comprising in combination:
a floor plate for attachment to said vehicle having at least one generally straight vertical leg;
a seat plate slidably mounted on said floor plate having a section horizontally displaced from said floor plate;
a vertically oriented cam shaft connected with said seat plate with a cam plate for selectively frictionally engaging with said vertical leg; and
means for imparting angular movement to said camshaft.

4,711,590

SELF-ALIGNING BEARING AND OIL CAP MOUNT FOR AN ELECTRIC MOTOR

Bryan L. Lakin, Springfield, Mo., assignor to Fasco Industries, Inc., Boca Raton, Fla.

Filed Dec. 6, 1985, Ser. No. 806,028
Int. Cl.[4] F16C *23/04, 33/74, 33/10*; H02K *5/16*
U.S. Cl. 384—206 **54 Claims**



1. In an electric motor or the like having a housing, a rotor and rotor shaft, and end shields, a self-aligning bearing mount for locating the rotor between the end shields of the motor housing, the end shields having sockets that receive self-aligning bearings for mounting the rotor shaft, said bearing mount comprising: a spacer, means securing said spacer to the rotor

shaft against axial movement relative thereto, said spacer having means defining a thrust surface; a spring having a hub portion through which the rotor shaft extends, a ring surrounding said hub, and resilient means between the hub and ring, said hub having a bearing seat, and said ring having means defining a thrust plate seat; a self-aligning bearing; and end shield having a socket therein receiving said self-aligning bearing, said bearing also seated against the bearing seat of the spring hub; a thrust plate seated within the thrust plate seat of the spring ring, said thrust plate seat locating and supporting said thrust plate in axially spaced relation to the spring hub and bearing; said thrust surface of said spacer running against a surface portion of said thrust plate spaced radially inwardly from said thrust plate seat.

4,711,591

PRINTER FOR PRINTING BY INK TRANSFER

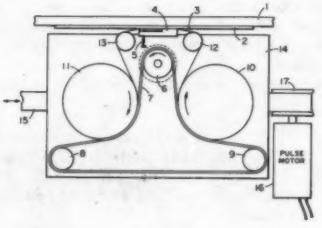
Mineo Nozaki, Kawasaki, and Osamu Asakura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 624,797, Jun. 26, 1984, abandoned, which is a continuation of Ser. No. 515,431, Jul. 18, 1983, abandoned, which is a continuation of Ser. No. 275,407, Jun. 18, 1981, abandoned. This application Feb. 10, 1986, Ser. No. 828,591

Claims priority, application Japan, Jun. 30, 1980, 55-88708; Jun. 30, 1980, 55-88709

Int. Cl.[4] B41J *33/32*

U.S. Cl. 400—225 **8 Claims**



1. A printer for printing on a printing medium with ink coated on a support material, said printer comprising:

a print head for transferring ink onf the support material onto the printing medium by the heat of said print head;

a carriage having said print head mounted thereon, said carriage being disposed for movement in the direction of a print line;

a first motor for moving said carriage in the direction of the print line, said first motor including print signal generating means for generating two types of signals;

a second motor mounted on said carriage for feeding the support material;

driving signal generating means for generating driving signals to be supplied to said first motor and said second motor, said driving signal generating means including control means responsive to one of the two types of signals from said print signal generating means for providing a driving signal to said second motor; and

feeding means mounted on said carriage, said feeding means being operative in response to said control means for causing said second motor to feed the support material by the same amount as the movement of said carriage.

4,711,592

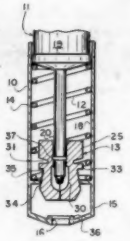
CAPLESS RETRACTABLE MARKING PEN

Allen R. Gregory, 3126 Tidewater Dr., Norfolk, Va. 23509

Filed Jun. 6, 1986, Ser. No. 871,469

Int. Cl.[4] B43K *9/00*

U.S. Cl. 401—107 **3 Claims**



1. In a marking pen comprising:

(a) a sheath having an upper portion and a lower portion terminating in an open front end,

(b) a writing member disposed at least partially within said sheath and having a cylindrical front portion of relatively small diameter terminating in a writing tip, and a rear portion of relatively large diameter which serves as a confining reservoir for marking fluid, and

(c) actuating means for causing movement of the writing member between a downwardly held writing position and an upwardly held non-writing position, the improvement comprising:

(d) an elastic sealing member positioned within the lower portion of said sheath and comprised of:

(1) an upper portion having a cylindrical bore centered upon the pen axis and having a diameter permitting penetrative insertion by the front portion of said writing member,

(2) an annular retaining groove communicating with said cylindrical bore,

(3) a lower portion having at least two segments having inner and outer surfaces and adapted to move between a divergent disposition and a converged disposition adjacent said axis wherein the inner surfaces mate to form a chamber whose upper extremity communicates with said bore, and

(4) an intermediate portion having recesses which permit said segments to move in hinge-like manner with respect to said upper portion,

(e) at least one pressing shoulder inwardly directed from the lower portion of said sheath and adapted to engage the outer surfaces of said segments whereby a pressing shoulder directs the segments to their divergent disposition and a pressing shoulder directs the segments to their converged disposition,

(f) holding means associated with the lower portion of said sheath and adapted to hold said segments in their divergent disposition, and

(g) an annular activating shoulder disposed upon the front portion of said writing member and adapted to fit tightly within said annular retaining groove, whereby,

(h) when said writing member is moved downwardly within said sheath, said activating shoulder forces said sealing member downwardly, causing; (1) said pressing shoulder associated with divergence of the segments to act upon exterior surfaces of the segments to direct the segments to their divergent disposition, (2) said segments to become held in their divergent disposition by said holding means, (3) said activating shoulder to leave said bore, and (4) said writing tip to protrude from the open front end of the sheath, and

(i) when said writing member is moved upwardly within said

sheath, said activating shoulder re-enters said bore, forcing said sealing member upwardly and causing; (1) said pressing shoulder associated with convergence of the segments to act upon exterior surfaces of the segments to direct the segments to their converged disposition, (2) placement of the writing tip within said chamber formed by the mated inner surfaces of the converged segments, and (3) sealing of the upper extremity of said chamber with the writing tip disposed therein.

4,711,593

METAL FITTING

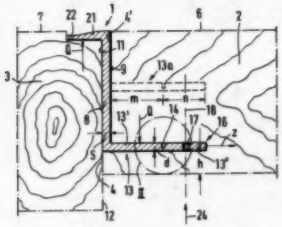
Juergen Wilhelmi, Syke-Wachendorf, Fed. Rep. of Germany, assignor to Heinrich Wilhelmi GmbH & Co., Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 822,062

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 3502234

Int. Cl.[4] F16B *7/08*

U.S. Cl. 403—187 **5 Claims**



1. A metal fitting for an end connection of a wood beam to a perpendicularly extending supporting structure, said fitting including: a web to be arranged between said end of said wood beam and said supporting structure; a supporting flange at an upper end of said web extending perpendicular to said web, said supporting flange to be received on the supporting structure; and at least one leg extending in an opposite direction to said supporting flange from the web, said leg being connectable at its free end portion to said wood beam by at least one fastening means extending perpendicularly to said leg, said leg having an upper surface being provided with a groove-like attenuation between said web and said fastening means, said attenuation extending over the full width of said leg and parallel to the web.

4,711,594

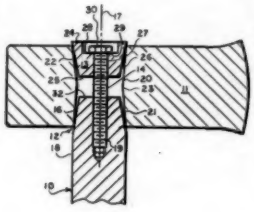
TOOL HANDLE AND HEAD ASSEMBLY

Jerry W. Agee, Rte. 1, Box 362, Paragould, Ark. 72450

Filed Feb. 24, 1987, Ser. No. 17,455

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—263 **2 Claims**



1. A tool assembly comprising:

(a) an elongated metal handle having a substantially straight center axis, a generally cylindrical surface, distal and proximal extremities, a conically tapered zone associated with said distal extremity and convergent onto a flat terminal face perpendicularly disposed to said axis, and a threaded axially aligned recess which opens upon said terminal face,

(b) a working head seated upon said distal extremity, said working head having a centered channel comprised of first and second conically tapered surfaces outwardly divergent from a site of confluence within said channel, said first tapered surface being configured to accommodate the tapered zone of said handle,

(c) a metal plug having parallel flat upper and lower faces and a conically tapered sidewall inwardly convergent at said lower face, and having an axial bore, said plug being in tight fitting engagement within said second conically tapered surface whereby said lower face is directed toward the terminal face of said handle, and

(d) a steel machine bolt which passes through the bore of said plug and threadably engages the recess of said handle, said bolt having a head that rests against the upper face of said plug, whereby tightening of said bolt draws both the handle and plug toward said site of confluence within the channel of said working head,

(e) the angles of the tapers of the tapered zone of the handle and sidewall of the plug being between about 2 and 10 degrees, and

(f) the angles of the tapers of the tapered zone of the handle and sidewall of the plug being about 1 degree greater than the taper angles of the first and second conically tapered surfaces of the channel, thereby causing a tapered annular gap to exist between the handle and working head.

4,711,595

DISMOUNTABLE STRUCTURE

Robert Magid, 83 Cholmley Gardens, West Hampstead, London NW6, England, and John Choong, 221a Victoria Rise, London SW4, England

Continuation of Ser. No. 604,905, Apr. 27, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 873,828

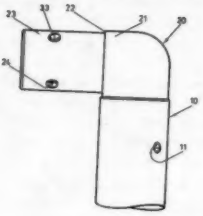
Claims priority, application United Kingdom, May 12, 1983, 8313067; Jan. 24, 1984, 8402148

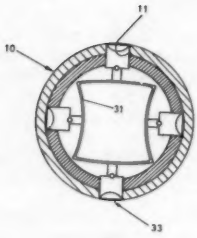
Int. Cl.[4] F16B *7/10, 21/00*

U.S. Cl. 403—108 **15 Claims**

1. A dismountable structure comprising a first structural part including a tubular female member having a pair of diametrically opposed first holes therein and a second structural part including a tubular male member having two pairs of diametrically opposed second holes therein, said second holes being disposed in a common radial plane with the holes in each pair of second holes being circumferentially spaced from the holes in the other pair of second holes, said members being dimensioned and configured so that said male member is alternatively receivable in said female member in a first locked position wherein one of said pairs of second holes is aligned with said first holes and a second locked position wherein the other pair of said second holes is aligned with said first holes, fastening means in said male member for alternatively securing said male and female members in said first or second locked positions, said fastening means comprising a resilient carrier having two pairs of diametrically opposed locking elements, said locking elements being resiliently, inwardly displaceable and being aligned with and received in said second holes, one pair of said locking elements extending into said first holes when said members are received in said first locked position but being resiliently displaced to a position wherein they resiliently engage the inner surface of said female member when said members are in said second locked position, the other pair of said

locking elements engaging the inner surface of said female member when said members are received in said first locked





position but extending into said first holes when said members are received in said second locked position.

4,711,596

APPARATUS FOR SECURING A CONNECTION

Werner Bruderer, Zürich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Feb. 3, 1986, Ser. No. 826,145

Claims priority, application Switzerland, Feb. 14, 1985, 665/85

Int. Cl.⁴ F16D *1/06*

U.S. Cl. 403—348 **7 Claims**

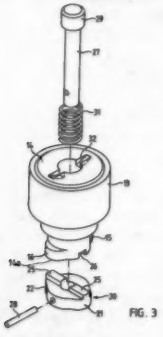


FIG. 3

1. An apparatus for ensuring for the security of a connection, especially a rotary connection, with a housing, comprising:

a bolt member inserted into said housing and having a lower situated surface;

said bolt member being connected with said housing by rotating said bolt member through a predetermined angle;

said security apparatus preventing the bolt member from unintentionally releasing itself from the housing upon unintentional rotation of said bolt member and said housing with respect to one another at said lower situated surface;

said housing being provided with groove means at said lower situated surface;

said bolt member being with groove means;

said security apparatus comprising a securing element displaceably guided in said groove means of said housing;

spring means for urging said securing element into engagement with said groove means of said bolt member;

an actuation pin;

means for connecting said actuation pin with said securing element; and

said actuation pin serving for displacing the securing element against the force of said spring means.

4,711,597

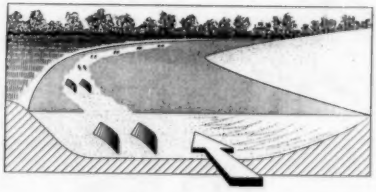
VANES FOR BANK PROTECTION AND SEDIMENT CONTROL IN RIVERS

A. Jacob Odgaard, and John F. Kennedy, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Jul. 18, 1986, Ser. No. 886,871

Int. Cl.⁴ E02B *3/04*

U.S. Cl. 405—25 **5 Claims**



1. A flow-training structure for use in open-channel flow of rivers and streams comprising a vane having an upstream end and a downstream end, a top surface and a bottom surface connecting the upstream end and downstream end, a double-curved convex surface on one side between the top and bottom surfaces and upstream and downstream ends and a double-curved concave surface on the other side, the upstream end being vertical and the downstream end having its center line lying in a vertical plane and inclined to the vertical thus creating the double-curved surfaces on each side of the vane, said curved surfaces producing directional changes in the flow when the vane is positioned in a river or stream.

4,711,598

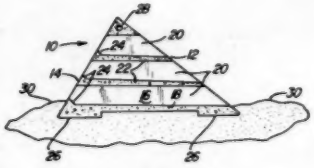
BEACH EROSION CONTROL DEVICE

Cecil Schaaf, and Craig Schaaf, both of 3015 Palmer Rd., Standish, Mich. 48658

Filed Sep. 26, 1986, Ser. No. 912,752

Int. Cl.⁴ E02B *3/04, 3/06*

U.S. Cl. 405—30 **6 Claims**



1. In a device for protecting shoreline from erosion of the type characterized by a generally prism-shaped module intended to be positioned on a surf-area floor and at least par-

tially submerged in the surf, and having a seaward-facing front wall and a landward-facing rear wall, the module having at least one passage extending therethrough from the front wall to the rear wall, the passage having a lower surface over which water flows as it passes through the passage, the passage having a smaller cross-sectional area at its opening in the rear wall than in the front, the improvement which comprises:

the lower surface of the portion of the passage immediately adjacent the rear wall opening defining a deflector which is upwardly and rearwardly inclined at an angle of between about 35 and 65 degrees relative to the lower surface of the forwardly-located adjacent portion of the passage;

whereby said deflector surface causes landwardly flowing water in the passage to be deflected upwardly as it exits the rear wall opening of the passage.

4,711,599
PAVING BLOCK

Michael N. Glickman, London, England, assignor to McCauley Corporation Limited, London, England

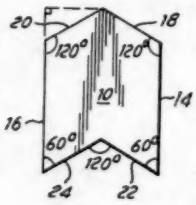
PCT No. PCT/GB85/00125, § 371 Date Nov. 20, 1985, § 102(e) Date Nov. 20, 1985, PCT Pub. No. WO85/04434, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 28, 1985, Ser. No. 805,475

Claims priority, application United Kingdom, Mar. 29, 1984, 8408129

Int. Cl.[4] E01C *5/00*

U.S. Cl. 404—41 **10 Claims**



1. A paving block having six side surfaces, a substantially planar top surface and a substantially planar bottom surface, said top and bottom surfaces being substantially at right angles to each one of said side surfaces, said six side surfaces including two longer side surfaces of essentially equal length and four shorter side surfaces of essentially equal length, said longer side surfaces being essentially parallel and essentially twice as long as said shorter side surface, two of said shorter side surfaces being located at one end of said longer side surfaces and essentially making an angle of 120° with respective ones of said longer side surfaces, and the other two of said shorter side surfaces being located at the other end of said longer side surfaces and essentially making an angle of 60° with respective ones of said longer side surfaces.

4,711,600
HEATING DEVICE FOR USE WITH ASPHALT PAVEMENT RESURFACING EQUIPMENT

Larry A. Yates, 889 Gardendale Dr., Columbia, S.C. 29201

Filed Jan. 8, 1985, Ser. No. 689,717

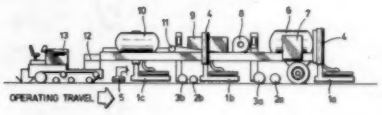
Int. Cl.[4] E01C *23/14*

U.S. Cl. 404—95 **1 Claim**

1. A device, for use on an asphalt pavement resurfacing apparatus traversing across the road surface, for the nondestructive, rapid, continuous heating of a depth of asphalt pavement from a temperature where the asphalt pavement is normally in a firm state to a higher temperature where the asphalt pavement is in a pliable state, at a rate of heating in which the heat output is sufficiently high to create temperatures which very rapidly bring up the surface temperature to a point where heat transfer through the depth is efficient and expedient, and that the elevated temperatures can be maintained with only miminal degradation of the asphalt pavement and consequential smoke, by the scrupulous exclusion of oxygen from the heated road surface, where said heating device consists of the elements of:

(a) equipment for generating a supply of a combustible mixture of pressurized gases to be burned in a burner assembly suspended over the road surface, said equipment consisting of a tank for holding the fuel, a means for vaporizing fuel fed from the tank, a primary pressure regulator for controlling the fuel to the burner assemblies, a secondary pressure regulator for controlling the fuel flow to an individual burner assembly, a blower for generating compressed air, an air control valve for regulating the flow of air to an individual burner assembly, a means for mixing and setting a selected ratio of fuel and air for an individual burner assembly, and a line for piping the gaseous mixture to an individual burner assembly, where the equipment enables the adjustment of the individual burner assemblies through a wide degree of turndown or ratio of gases;

(b) a burner assembly consisting of a structural frame onto



which are mounted in a single layer, on the underneath side of the frame, a plurality of open flame, directional burners, a plurality of insulation pans filled with high emmissitivity insulation interspaced among and contiguous with the burners, and a flexible skirt mounted on the perimeter of the frame, which drapes from the frame to the surface of the road, where the combined elements of the frame, the burners, the insulation pans, the insulation and the skirt, together form a pressurizable burner chamber over the road surface, and where the burners, which serve as a partial wall of that chamber, are in direct contact with the cooling, outside air;

(c) suspension elements for attaching the burner assembly to the asphalt pavement resurfacing apparatus, where the suspension elements enable the burner assembly to be adjusted such that the assembly follows the road contour;

and when the device is in operation the heat output of the burner assemblies can be adjusted up to very high levels without seriously degrading the asphalt pavement by maintaining a pressure sufficiently positive in the burner chamber to occlude the entrance of outside air, even when said outside air is not uniformly pressurized as is the case with a wind.

4,711,601
METHOD OF INSTALLING OFFSHORE CONSTRUCTIONS

Isaac Grosman, Julian Alvarez 2427, Buenos Aires, Argentina

Continuation of Ser. No. 740,317, Jun. 3, 1985, which is a continuation of Ser. No. 536,249, Sep. 27, 1983, abandoned. This application Jul. 28, 1986, Ser. No. 892,878

Int. Cl.[4] E02B *17/00*; E02D *5/00*

U.S. Cl. 405—204 **22 Claims**

1. A method of constructing and installing an offshore gravity structure type construction in a body of water, by assembling columns one-by-one using column sections for each individual column, comprising the steps of:

(a) providing a number of hollow, unconnected supporting column sections;

(b) transporting a plurality of said unconnected column sections to a construction site on a sea going vessel;

(c) providing only one construction vessel with at least two hoisting systems thereon;

(d) arranging, with one hoisting system on said one construc-

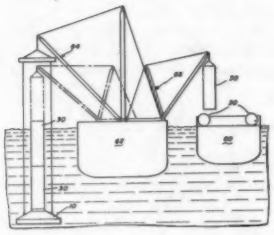
tion vessel, a single first one of the column sections for a single column near the surface of a body of water;

(e) at least partly submerging with said one hoisting system the single first column section for said single column in the body of water by a certain amount;

(f) placing, with another of said at least two hoisting systems, a single second one of the column sections on the top of the first column section and joining the top of the first column section to the bottom of the single second column section near the surface of the body of water to thereby build up a single column;

(g) at least partly submerging with said one hoisting system the second column section as jointed to the first column section by a depth substantially equal to the length of the second column section;

(h) repeatedly placing with said another hoisting system on



said one construction vessel additional single ones of the column sections, one-by-one, on top of each of the column sections after each column section is at least partly submerged with said one hoisting system on said one construction vessel, and joining the tops of the partly submerged column sections to the bottoms of the additional column sections near the waters' surface until a single column of desired height, and having its bottom resting by gravity on the bed of the body of water, is formed by the joined column sections; and

(i) repeating steps (d) to (h) to form at least a second individual column of desired height by joining a plurality of column sections one-by-one, said second column being spaced from said first mentioned column, said steps (d) to (h) being repeated until a desired plurality of columns are erected in a desired arrangement relative to each other with only said single construction vessel.

4,711,602

TURBULENT FLOW GATE FOR THE INJECTION MOLDING OF TUBULAR PARTS, INCLUDING PARISONS SUITABLE FOR BLOW MOLDING

W. Howard Baker, Hartsville, Tenn., assignor to Precision Rubber Products Corporation, Lebanon, Tenn.

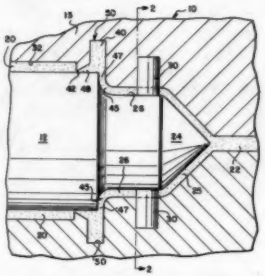
Filed Jul. 17, 1986, Ser. No. 886,459
Int. Cl.[4] B29C *31/04*
U.S. Cl. 425—206 **6 Claims**

1. Injection apparatus for forming a molded part such as a parison free of weld lines in a mold cavity about a core by injection of plastic material into said cavity through an annular gate surrounding said core from an annular lead-in passage, and in which said core is supported on one or more core pins, which core pins extend through the annular lead-in passage and cause a parting of the plastic material flowing through said passage to said gate, the improvement comprising:

means in said injection apparatus between said passage and said gate defining an annular mixing chamber opening into said passage at a radially inner portion of said chamber,

said mixing chamber communicating with said gate at a radially inner portion thereof axially spaced from said annular passageway,

said mixing chamber having a volume which is at least twice the volume defined by said annular lead-in passage downstream of said core pins, providing for a volumetric expansion and dwell of plastic material entering therein from said passage accompanied by reversal of direction of



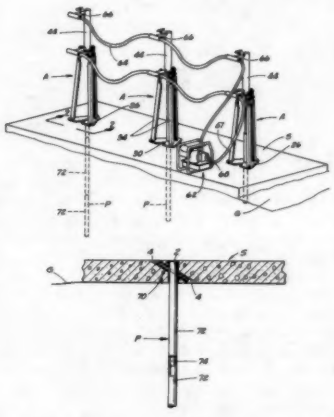
movement of said material creating shear in said material and the remixing of said material across the weld lines formed by said core support pins.

4,711,603

SLAB JACKING PROCESS AND APPARATUS

Dondeville M. Rippe, Jr., Edgewater, and David T. Scaturro, Littleton, both of Colo., assignors to Magnum Piering, Inc., St. Louis, Mo.

Filed Feb. 25, 1985, Ser. No. 705,202
Int. Cl.[4] E02D *7/02*
U.S. Cl. 405—230 **17 Claims**



1. A process for stabilizing and supporting a slab of concrete that extends over underlying ground, said process comprising:

boring a vertical hole entirely through the slab at a location where the slab is to be supported;

boring an oblique hole into the slab from the upper surface thereof, with the oblique hole intersecting the vertical hole and being substantially smaller in diameter than the vertical hole;

driving a pier through the vertical hole and into the underlying ground, the pier being small enough to pass through the vertical hole;

exerting a downwardly directed force on the pier while at the same time resisting that force with an upwardly directed counterforce applied to the slab in the region of the vertical hole;

thereafter while the force and counterforce are applied, drilling a hole transversely through the pier with that hole being axially aligned with the oblique hole in the slab;

thereafter while the force and counterforce are applied, inserting a pin through the

oblique hole in the slab and into the transverse hole of the pier such that the pin projects from the transverse hole into the oblique hole; and thereafter releasing the force and counterforce, whereby the slab in the region of the vertical hole is supported by the pier.

4,711,604

METHOD OF AND APPARATUS FOR INSTALLING AN ANCHOR MEMBER BELOW WATER LEVEL THROUGH A WALL INTO A SOIL FORMATION

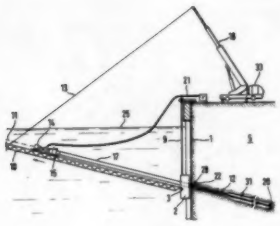
Harald Heimsoth, Hamburg, and Thomas Herbst, Wessling, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft

Filed Oct. 3, 1986, Ser. No. 915,318

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535319

Int. Cl.[4] **E02D** *29/06*

U.S. Cl. 405—260 **21 Claims**



1. Method of installing an anchor member, such as a rod, cable or pipe, into a soil formation retained by a wall where the installation can be effected through the wall below a water level, comprising the steps of mounting a retaining member on the wall at the location where the anchor member is to be installed through the wall into the soil formation, positioning an elongated drill mount having a first end and a second end on the retaining member, supporting a drilling member on the drill mount, drilling an opening through the wall by means of the drilling machine, inserting the anchor member through the opening in the wall and into the soil formation, and anchoring the anchor member within the soil formation, wherein the improvement comprises, after adjusting and attaching the retaining device to the wall, supporting the first end of the drill mount on the retaining device for pivotal movement about a horizontal axis, lifting the drill mount adjacent the second end thereof above the water level into a loading position, pivoting the drill mount about the horizontal axis at the first end thereof, arranging the drilling member adjacent the second end of said drill mount and placing a first drilling tool in the drilling member in the loading position, lowering the drill mount into a drilling position inclined downwardly toward the wall, moving the drilling member toward the wall and drilling the opening through the wall using the drilling member and the first drilling tool, withdrawing the drilling member away from the wall after the opening has been formed and lifting the drill mount upwardly to the loading position so that the second end of the drill mount is located above the water level, replacing the first drilling tool above the water level with a borehole pipe and attaching the borehole pipe to the drilling member, lowering the drill mount from the loading position into the drilling position and driving the borehole pipe through the opening in the wall and for the desired depth into the soil formation and forming a borehole within the soil formation, inserting the anchor member for the desired depth into the borehole pipe, and after the insertion of the anchor member withdrawing the borehole pipe and at the same time injecting a settable grout material into the space between the borehole and the anchor member, and lifting the drilling mount into the loading position for removing the borehole pipe.

4,711,605

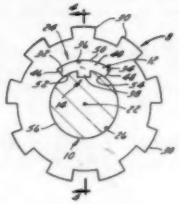
KEY APPARATUS

Wasyly G. Hodlewsky, Greendale, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed May 29, 1986, Ser. No. 869,159

Int. Cl.[4] **F16D** *1/08;* **F16H** *55/12*

U.S. Cl. 403—355 **13 Claims**



1. A key apparatus for transferring rotating force having a predetermined direction between first and second rotatable members engaging each other and respectively including first and second facing keyways having lengths transverse to the direction of the rotating force, the second keyway having a side positioned transversely to the direction of the rotating force, comprising:

a key including:

a leg portion having a width and being positioned in the first keyway; and

a cross portion integral with the leg and having a width greater than the width of the leg, the cross portion being positioned in the second keyway of the second rotatable member and having an end engaging said transverse side of the second keyway at an angular distance from the leg portion whereby rotating force applied to one of the rotatable members is transferred to the other member through the keyways and through the leg and cross portions including the transverse side of the key.

4,711,606

SHAPED (CONCRETE) BLOCK FOR RETAINING WALLS AND ALSO A RETAINING WALL

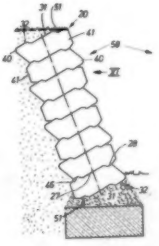
Menno Leling, Bremen, and Gerhard Hagenah, Worpswede, both of Fed. Rep. of Germany, assignors to SF-Vollverbundstein-Kooperation GmbH, Bremen, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,804

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1985, 3505530; European Pat. Off., Nov. 4, 1985, 85114011.1

Int. Cl.[4] **E02D** *29/02*

U.S. Cl. 405—286 **14 Claims**



1. A shaped block of concrete for making a retaining wall (20) which is inclined, relative to the vertical, towards an earth backfill, and which consists of shaped blocks which are arranged one above the other in layers and which have upper

sides and under sides in engagement with one another, characterized in that:

the upper side (23) of the shaped block has three parallel planar seating surfaces (27,28,46) and two stop surfaces (30,48);

the seating surfaces of the upper side (23) comprise a main surface (27) and smaller first and second surfaces (28,46) at first and second ends of the block and lying in planes equally displaced below and above the plane of the main surface (27);

the stop surfaces (30,48) of the upper side (23) extend, respectively, between the main surface (27) and the first end surface (28) of the upper side (23) and between the main surface (27) and the second end surface (46) of the upper side (23);

the under side (24) of the shaped block has three parallel planar seating surfaces (31, 32, 51) and two stop surfaces (34,52);

the seating surfaces of the under side (24) comprise a main surface (31), extending parallel to the main seating surface (27) of the upper side (23), and smaller first and second end surfaces (32,51) at the first and second ends of the block and lying in planes equally displaced below and above the plane of the main surface (31) of the under side (24) to the same extent that the first and second end surfaces (28,46) of the upper side (23) are displaced from the plane of the main surface (27) of the upper side (23); and

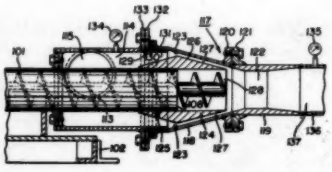
the stop surfaces (34,48) of the under side (24) extend, respectively, between the main surface (31) and the first end surface (32) of the under side (24) and between the main surface (31) and the second end surface (52) of the under side (24), and are separated from each other to the same extent as the stop surfaces (30,48) of the upper side (23).

4,711,607

HIGH SPEED AUGER VENTURI SYSTEM AND METHOD FOR CONVEYING BULK MATERIALS

Charles E. Wynosky, Minersville, Pa., and Joseph Mraz, Plant City, Fla., assignors to Coalair Systems, New York, N.Y.

Filed Oct. 22, 1985, Ser. No. 790,056
Int. Cl.[4] B65G *53/48, 53/66*
U.S. Cl. 406—30 **14 Claims**



1. A conveying system for particulate material comprising:

a cylindrical barrel having first and second ends;

an auger conveyor rotatably mounted within the barrel;

means for supplying the particulate material to the auger conveyor;

means for rotating the auger conveyor in an appropriate direction so as to transport the particulate material towards the first end of the barrel;

a plenum chamber surrounding the barrel adjacent the first end thereof;

a venturi pipe coupled to the plenum chamber and enclosing the first end of the barrel, the venturi pipe having a first tapered section leading directly to a relatively short constriction located beyond the first end of the barrel and a second tapered section of increasing cross-sections directly downstream of the constriction;

a jet member within the venturi pipe coupled to the first end of the barrel and extending substantially adjacent to the constriction, the jet member having an outer surface appropriately shaped to conform with the interior surface of the first tapered section of the venturi pipe to form a relatively narrow annular passage from the plenum chamber to the constriction, the jet member having an axial bore for channeling the particulate material transported by the auger conveyor into a region substantially adjacent the constriction of the venturi pipe;

means for introducing a pressurized gas into the plenum chamber; and

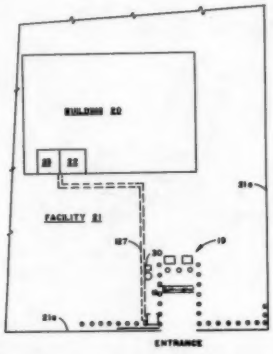
means for coupling the venturi pipe to a conduit.

4,711,608

VEHICLE ACCESS CONTROL SYSTEM

Abdallah E. Ghusn, 2819 San Juan Blvd., Belmont, Calif. 94002

Filed Jun. 27, 1985, Ser. No. 749,225
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **18 Claims**



1. A failsafe system for protecting a facility from unauthorized entry by a road vehicle, the system including:

an enclosing vehicle-impervious barrier for surrounding the perimeter of the facility,

at least one controlled entry and exit vehicle lane for road vehicles extending through the barrier at a predetermined location, the lane including:

plural spaced apart fixed lane delineation means for defining the right and left boundaries of the lane through the barricade, the lane delineation means being reinforced, slightly wider than the widest of road vehicles authorized access to the facility and of a height above a road surface of the lane for effectively blocking and preventing travel of a road vehicle except over the surface of the lane between the right and left boundaries thereof, the delineation means including physical obstructions for constraining vehicular traffic to a predetermined passageway adjacent said facility,

a series of operably releasable reinforced barricades placed in the lane, each barricade having an obstruction position effective to block vehicle movement therebeyond, the barricades being arranged successively in the lane, so that if a first barricade in its obstruction position is passed by an unauthorized vehicle, a second barricade in its obstruction position remains in its path, and if the second barricade in its obstruction position is passed, a third barricade in its obstruction position remains in its path,

a series of prime movers, each prime mover being connected to operate a said barricade so that it may be released and withdrawn under positive control from its obstruction position;

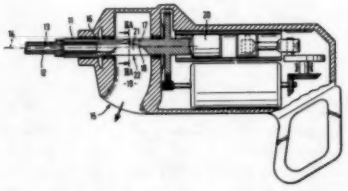
the system further including integrated controller means for controlling the operations of the prime movers so that the barricades may be emplaced in their obstruction positions and may be released from their obstruction positions to enable a single authorized vehicle at a time to pass said barricades, the integrated controller means being adapted

to emplace and maintain the barricades in their respective obstruction positions in a failsafe mode in the absence of a control signal generated to permit passage over the lane by an authorized vehicle; and, a bullet-proof observation booth that houses the primary controls for the entire security system and from which an operator may see all vehicular traffic approaching and entering said lane and from which said single controller means may be controlled.

4,711,609
DRILL TOOL

U. Christian Seefluth, Hamburg, Fed. Rep. of Germany, assignor to Sita Baulemente GmbH, Pinneberg, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,049
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224141; Jul. 8, 1982, 3225519; Oct. 12, 1982, 3237721
Int. Cl.[4] B23Q *11/00*
U.S. Cl. 408—68 **4 Claims**



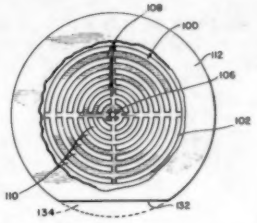
1. A power tool including a drive means, a housing means for accommodating said drive means, a drilling tool, and means for detachably connecting the drilling tool to the power tool, the drilling tool comprising a shank portion, a drill head means provided on said shank portion, a continuous bore means extending through said drill head means and said shank portion for receiving a discharging core material, the continuous bore means are disposed concentrically to a longitudinal center axis of the drilling tool and extend along an entire axial length of the shank portion, a further bore means is provided in a portion of said drive means and forms an extension of said continuous bore means, said further bore means includes a recess portion having a substantially circularly shaped deflection surface terminating in an outwardly directed opening in a portion of said drive means at a position shortly behind a mounting position of the drilling tool in the power tool, said outwardly directed opening being in communication with a discharge space defined by a portion of the housing means of the power tool and having a substantially radially outwardly directed outlet through which the core material from the continuous bore means and said further bore means is discharged from the power tool, and wherein said discharge space has a diameter greater than a diameter of said continuous bore means and said further bore means.

4,711,610
BALANCING CHUCK

Roger W. Riehl, Parsippany, N.J., assignor to Machine Technology, Inc., Parsippany, N.J.

Filed Apr. 4, 1986, Ser. No. 848,806
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 409—141 **35 Claims**

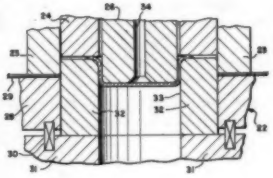
1. A chuck for balancing a rotating object comprising a housing securing said object for rotation therewith, an annular race within said housing, a counterweight positionable within said race, said race having a first region provided with a plurality of retaining means for releasably retaining said counterweight at a selected location within said first region during rotation of said housing and a second region constructed to permit relative movement between said counterweight and said housing, and control means for controlling the movement of said counterweight between said first region and said second region for arranging said counterweight in retained association with a selected one of said retaining means at a location corresponding to a selected portion of said object.

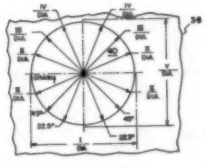


4,711,611
METHOD AND APPARATUS FOR FABRICATING A CAN BODY

Henry C. Bachmann, and Ermal C. Fraze, both of Dayton, Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Jul. 23, 1986, Ser. No. 889,054
Int. Cl.[4] B21D *51/28*
U.S. Cl. 413—69 **16 Claims**





1. A method of fabricating from ductile sheet metal a can body with an integral bottom wall, comprising the steps of:

forming a rounded non-circular blank having an outer edge from a sheet of ductile metal, said outer edge being continuously rounded, said blank having a greater width across the grain of the metal than along such grain;

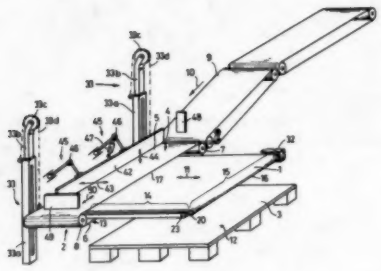
forming said blank into a cup-shaped receptacle having a bottom wall and a side wall of not less than the desired inside diameter of the can body, said side wall having an axial dimension substantially less than the desired axial dimension of the can body with the side wall of said receptacle substantially thicker than the thickness desired in the finished can body; and

thinning the side wall of said receptacle to the desired thickness of the can body so as to lengthen the side wall in the axial direction to at least the desired axial dimension of the can body.

4,711,612
PALLETING DEVICE

Gerd-Georg Kwauka, Gutersloh, Fed. Rep. of Germany, assignor to Mohndruck Graphische Betriebe GmbH, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,362
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411295
Int. Cl.[4] B65G 57/24
U.S. Cl. 414—68 20 Claims



1. In a device for the palleting of slab-form products, especially of book blocks or books, provided with a first arrangement for feeding the products, a second arrangement for forming the products into a product row, and a third arrangement for receiving a product set consisting of several product rows, with the third receiving arrangement being provided with drive means for advancing and retracting the third receiving arrangement relatively to the second forming arrangement, an improvement comprising:

said third receiving arrangement including a double rolling band;

said double rolling band including a first endlessly guided upper band and a second endlessly guided lower band;

said first upper band having upper and lower band portions;

said second lower band having upper and lower band portions;

said lower band portion of said second lower band being spaced below said upper band portion of said first upper band;

said first upper band being provided with a first coupling, and said second lower band being provided with a second coupling;

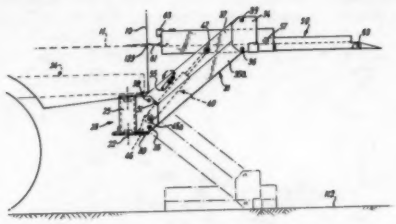
each of said first and second couplings having an out-of-engagement arrangement with respect to said drive means so that the double rolling band is not driven during said advancing of said third arrangement and so that said first upper band remains stationary relatively to said second lower band; and

each of said first and second couplings further having an in-engagement arrangement with respect to said drive means for driving said first upper and second lower bands in opposite directions during said retracting of said third receiving arrangement in such a manner that an upper surface of said upper band portion of said first upper band remains stationary relatively to a lower surface of said lower band portion of said second lower band and to said second forming arrangement to provide a roll-off relationship between said upper band portion of said first upper band and the product set when the product set is disposed on said upper surface so that said upper band portion of said first upper band rolls off from under the product set when said third receiving arrangement is retracting, and to also provide a roll-off relationship between said lower band portion of said second lower band and a pallet on which said lower surface rests so that said lower band portion of said second lower band rolls off from above said pallet in order for said pallet to receive the product set thereon.

4,711,613
VEHICLE LIFT DEVICES

Percy Fretwell, Rochdale, England, assignor to Henderson Doors Limited, Romford, England

Filed Apr. 23, 1984, Ser. No. 602,734
Claims priority, application United Kingdom, Apr. 28, 1983, 8311632
Int. Cl.[4] B60P 1/44
U.S. Cl. 414—550 8 Claims

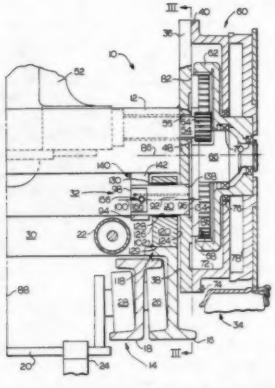


1. A vehicle comprising a floor, and a lift device including a platform, means mounting the lift device below the level of the floor for rotation about an upright axis between an operative position, in which the lift device extends from the vehicle, and an inoperative position, in which the platform is beneath the floor, said lift device including means for moving the platform up and down in the operative position, and a parallel linkage for connecting the platform to the mounting means, said upright axis being located beneath the floor, said means for moving being substantially wholly outwards of the upright axis in the operative position and extending between said mounting means and said parallel linkage.

4,711,614
LIFT MAST MOUNTING ARRANGEMENT AND METHOD FOR REMOVAL

James W. Erker, Concord; Michael J. Scotese, Willoughby, and Jay B. Stotts, Mentor, all of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Feb. 24, 1985, Ser. No. 832,495
Int. Cl.[4] B66F 9/08
U.S. Cl. 414—641 15 Claims



1. A mounting arrangement for pivotally connecting a lift

mast assembly to a vehicle having a frame member, comprising:

a support flange having first and second opposed sides, and being connected at said first side to the frame member;

a spindle having a first end, a spindle axis, and being connected at the first end to the support flange second side;

a lift mast upright guide member having a first end portion;

a shaft having first and second spaced apart end portions, first and second ends, and a longitudinal axis extending between said shaft first and second ends;

first means for pivotally connecting the first end portion of the lift mast upright guide member to the shaft;

second means for connecting the first end portion of said shaft to the support flange and guiding said shaft for slidable axial movement in directions substantially parallel to said spindle axis, said second means including an aperture disposed in said support flange and opening at the first and second sides of the support flange, said shaft first end portion being disposed in said aperture and slidably engaged with a surface defined by said aperture in said support flange, said spindle first end being positioned in a covering and closing relationship relative to the support aperture opening at said flange second side;

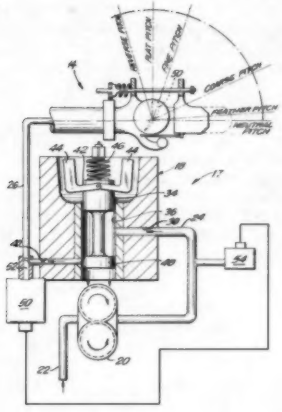
third means for connecting the second end portion of said shaft to said frame member and maintaining said shaft from slidable axial movement in said directions substantially parallel to the spindle axis and relative to the first side of the support flange.

4,711,615

TURBOPROP OVERSPEED PROTECTION SYSTEM

Radu Rusu, Bridgeport, Conn., assignor to Textron/Auca Corp., Providence, R.I.

Filed May 19, 1986, Ser. No. 864,602
Int. Cl.[4] B64C *11/40*
U.S. Cl. 416—46 **15 Claims**



1. An overspeed protection system for a turboprop engine comprising a turbine, an array of propeller blades rotatably driven by gear reduction drive means operatively engaged with said turbine, a fluid actuated pitch adjustment means mounted to said array for adjusting the pitch of the propeller blades, and a source of fluid in communication with said pitch adjustment means, said overspeed protection system comprising:

a governor pump in communication with the source of fluid for producing a constant pressure flow of the fluid from said source;

a constant speed governor in communication with and intermediate said governor pump and the pitch adjustment means for directing flow of the fluid to the pitch adjustment means at a pressure proportional to the speed of the turbine;

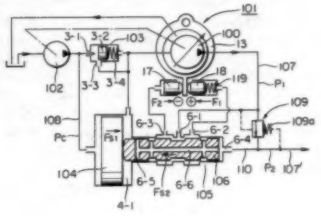
pressure stabilizing means disposed intermediate said constant speed governor and said pitch adjustment means operable for preventing variations in pressure between said pressure stabilizing means and said pitch adjustment means; and a pressure sensing means disposed intermediate said governor pump and said constant speed governor for sensing a reduction in the pressure of the fluid produced by said governor pump by reason of failure of the gear reduction drive means, said pressure sensing means being operatively connected to said pressure stabilizing means such that a pressure change sensed by said pressure sensing means activates said pressure stabilizing means to prevent variations in pressure intermediate said pressure stabilizing means and said pitch adjustment means.

4,711,616

CONTROL APPARATUS FOR A VARIABLE DISPLACEMENT PUMP

Kenji Tsukahara, Obu, and Taizou Abe, Chiryu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 12, 1985, Ser. No. 808,836
Claims priority, application Japan, Dec. 13, 1984, 59-264257; Dec. 17, 1984, 59-267121
Int. Cl.[4] F04B *1/06*
U.S. Cl. 417—216 **11 Claims**



1. A control apparatus for a variable displacement pump which comprising:

a variable displacement pump rotatingly driven by an external engine;

means for varying an amount of displacement of said pump;

valve means for switching operational fluid which is to be applied to and to operate said varying means;

means for generating a control pressure the magnitude of which is proportional to the rotational speed of said external engine;

means for transducing the control pressure from said generating means into a force and for applying said force to one end of said valve means;

a discharge line connecting said discharge port of said pump with an external load;

a pilot line branched off from said discharge line into said valve means for applying a pressure in said discharge line to the other end of said valve means; and

said transducing means including a balance piston having a detecting surface to which said control pressure from said generating means is applied and an opposite surface contacting the valve means, and wherein the area of said detecting surface is greater than the area of the other end of said valve means.

4,711,617

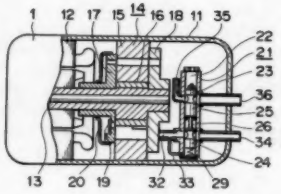
ROTARY COMPRESSOR

Kazutomo Asami; Fumiaki Sano; Fumio Wada, and Koji Ishijima, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1987, Ser. No. 38,166

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—295 **10 Claims**



1. In a rotary compressor including a closed container, an electric motor accommodated in said closed container, a compressor element accommodated in said closed container and adapted to be rotated by said electric motor, a first intake passage connected to said closed container for receiving a refrigerant gas, and a first discharge passage connected to said closed container for discharging said refrigerant gas after compressed by said compressor element from said closed container to a refrigerating cycle; the improvement comprising a cylindrical member provided inside said closed container and communicated with said first intake passage and with said first discharge passage; a second intake passage communicated with said cylindrical member and with said compressor element; a second discharge passage communicated with said cylindrical member and within said closed container; a first communication passage for communicating said second intake passage with one end of said cylindrical member; a second communication passage for communicating said closed container with the other end of said cylindrical member; a valve member provided in said cylindrical member; and a spring which urges the end of said valve near said first communication passage; said valve member being moved to a first position to communicate said first intake passage with said second intake passage and also communicate said first discharge passage with said second discharge passage when one end of said valve member is urged by a discharge pressure of said refrigerant gas through said second communication passage, while said valve member being moved to a second position to make said first intake passage out of communication with said second intake passage and also make said first discharge passage out of communication with said second discharge passage when the other end of said valve member is urged by a reverse current pressure of said refrigerant gas from said first communication passage and a spring pressure.

4,711,618

FUEL INJECTION PUMPS

Raymond E. Abinett, Rochester, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

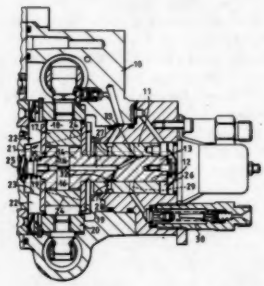
Filed Jun. 1, 1987, Ser. No. 56,542

Claims priority, application United Kingdom, Jun. 3, 1986, 8613409

Int. Cl.[4] F04B *19/22, 29/00, 49/00*

U.S. Cl. 417—462 **1 Claim**

1. A rotary distributor fuel injection pump comprising a rotary distributor member which is mounted within a cylindrical bore defined in a fixed body part, the distributor member defining a plunger bore in which is mounted a reciprocable plunger, the plunger during inward movement under the action of cam means displacing fuel from said plunger bore, a passage in the distributor member which receives fuel from the bore during the inward movement of the plunger, a plurality of angularly spaced outlet ports formed in the body and opening onto the surface of the cylindrical bore, a delivery groove on the periphery of the distributor member, said delivery groove registering with said outlet ports in turn during successive inward movements of the plunger, a plurality of angularly spaced inlet ports formed in the body and opening onto the surface of the cylindrical bore, the inlet ports and outlet ports being disposed in axially spaced planes respectively, said inlet ports communicating with a source of fuel under pressure, at least one inlet groove on the periphery of the distributor member and positioned to register in turn with said inlet ports to allow fuel to flow into said plunger bore during the time the



plunger is allowed to move outwardly by said cam means, stop means for limiting the outward movement of the plunger, said stop means being constructed so that the extent of outward movement of the plunger depends upon the axial position of the distributor member within the cylindrical bore, first and second balancing grooves formed on the periphery of the distributor member for communication with the inlet ports and outlet ports respectively, a passage extending within the distributor member and interconnecting the balancing grooves, said balancing grooves effecting communication as the distributor member rotates, between each outlet port and an inlet port to stabilise the fuel pressure in the outlet ports.

4,711,619

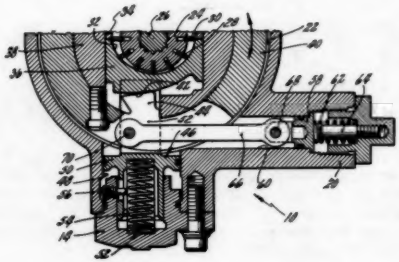
VANE FUEL PUMP HAVING REDUCED DISPLACEMENT AT HIGH SPEEDS

Jack G. Sundberg, Meriden, and Godwin L. Noell, Winsted, both of Conn., assignors to Colt Industries Inc., New York, N.Y.

Filed Nov. 21, 1986, Ser. No. 933,664

Int. Cl.[4] F03C *2/00;* F04C *2/00, 15/04*

U.S. Cl. 418—27 **4 Claims**



2. An improved variable displacement vane pump of the type having: a housing; a rotor with a plurality of radially movable vanes mounted for rotation in the housing; a first tract element and a second track element mounted in the housing in confronting relationship and defining a smooth track surface for the vanes, the first and second track elements being mov-

able toward and away from the rotor and the track elements having respective cam surfaces thereupon; an actuation structure, having a two cam followers, mounted in the housing such that the cam followers respectively engage the cam surfaces for controlling the position of the track elements to vary the pump displacement, wherein the improvement comprises:

the cam surfaces and cam followers being engagable such that movement of the track elements away from the rotor produces a corresponding movement of the actuation structure;

bias force means to apply a bias force to the actuation structure to prevent movement of the actuation structure and the track elements until the fluid pressure forces and vane forces acting on the track elements cause the cam surfaces to exert a greater force on the actuation structure in opposition to that of the bias force and to thereafter permit predetermined respective movement of tract elements to new positions, the bias force means comprising:

two links in the housing pivotally connected to the actuation structure;

two pistons mounted in the housing for axial movement and respectively connected to the links; and

two compression springs mounted in the housing in respective engagement with the pistons for applying forces on the pistons in opposition to those applied thereto by the link.

4,711,620

MOVING VANE TYPE COMPRESSOR

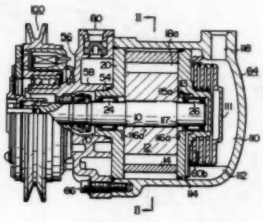
Yukio Takahashi; Isao Hayase, both of Katsuta; Keijirou Amano, Mito; Masao Mizukami, and Masaaki Ishiguri, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of, Japan

Filed May 28, 1985, Ser. No. 738,266

Claims priority, application Japan, May 28, 1984, 59-106617

Int. Cl.[4] F04C *18/344*

U.S. Cl. 418—96 **1 Claim**



1. A moving vane type compressor for an automotive air conditioner comprising: a rotor fixed to a rotor shaft; a cylinder having an inner peripheral surface surrounding an outer peripheral surface of said rotor and of a curvature different from that of the outer peripheral surface of said rotor; a pair of side plates on both end surfaces of said cylinder and substantially hermetically sealing an interior of said cylinder; and vanes respectively slidably received in a plurality of radially extending vane grooves formed in said rotor and adapted to be moved into and out of said vane grooves while rotating together with said rotor in sliding contact with the inner peripheral surface of said cylinder, said rotor, said cylinder, said side plates and said vanes in cooperation defining work chambers volumes of which are changed as a result of movement of said vanes into and out of said vane grooves such that a gas is drawn into said working chambers and compressed and then discharged from said working chambers, of a sintered alloy having a plurality of pores; a blocking liquid is supplied from the outer peripheral surface of said cylinder into said pores so as to block said pores, said blocking liquid being a lubricating oil; a casing for cooperating with said cylinder and said side plates for defining a chamber for holding said lubricating oil on the outer peripheral surface of said cylinder so that the lubricating oil blocks said pores of the sintered alloy of the cylinder and to prevent a leakage of compressed gas out of said cylinder; a liquid separating means separating said liquid from said compressed gas when said compressed gas is discharged to the interior of said casing; and for collecting said liquid in said chamber reserving said liquid and a liquid collecting and supply means is provided for supplying said liquid into said pores of said sintered alloy constituting said cylinder from the outer peripheral surface of said cylinder.

4,711,621

INJECTION MOLDS INTENDED FOR THE PRODUCTION OF COMPOSITE BODIES SUCH AS MULTICOLORED LIGHT COVERS OR COMPONENTS MADE OF SEVERAL DIFFERENT MATERIALS

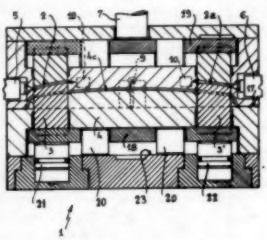
Jacques Schomblond, Montagnieu, France, assignor to Cartier Industrie, Thyez, France

Filed Mar. 20, 1986, Ser. No. 841,930

Claims priority, application France, Mar. 22, 1985, 85 04518

Int. Cl.[4] B29C *39/12, 45/10, 45/16*

U.S. Cl. 425—120 **10 Claims**



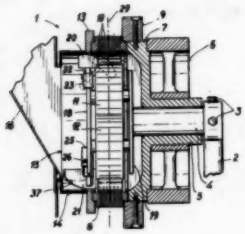
1. An apparatus for molding composite bodies having at least three separately injected sections formed of separate molding materials which are joined along aligned intersections comprising, a first molding block means of two mold members defining a first mold cavity therebetween, first and second adjustable molding block means movable relative to said first molding block means and having second and third cavities therein, respectively, at least said first adjustable molding block means being in slideable engagement with said first molding block means, means for moving said first and second adjustable molding block means between first positions in which said second and third cavities are closed and remotely spaced from said first cavity and second positions wherein said second and third cavities are aligned in open communication with said first cavity, first injector means for introducing molding material into said first cavity, second injector means spaced from said first injector means introducing molding material into said second cavity when said first adjustable block means is in said first position and third injector means for introducing molding material into said third cavity whereby the material is introduced into said second cavity when said second cavity is remote from said first cavity to form one of the three sections of the composite body and thereafter moved into alignment with said first cavity.

4,711,622

PELLET MILL

Hanspeter Schaffner, Niederuzwil, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Filed Jun. 12, 1985, Ser. No. 744,056
Claims priority, application Switzerland, Jul. 4, 1984, 3220/84
Int. Cl.[4] B28B *3/20*
U.S. Cl. 425—331 29 Claims



26. A pellet mill, which comprises:

a perforated cylindrical die mounted for rotation about a longitudinal axis, said die having an inner surface of predetermined axial width and an open front end, said width being divided in half by a vertical transverse plane intersecting said longitudinal axis;

means for effecting rotation of said die in a predetermined direction about the longitudinal axis;

a cover secured to the front end of said die for rotation therewith, said cover including upper and lower ends and an inlet opening;

a pair of rotatable press rollers located in the interior of said die and engaging opposite locations on the inside surface thereof, said press rollers being arranged diagonally;

means for feeding material to be pelleted through the inlet opening of said cover for pressing by said rollers through said perforated die to form pelleted material;

a lower deflector positioned in the bottom end of said cover and across the lower front end of said die, said lower deflector having a bottom arcuate edge of similar curvature to said cover and being of sufficient height and width to substantially block further flow of material into said die when said die is not rotating;

said lower deflector including a straight portion extending diagonally across said cover, and a bent portion extending generally parallel to said transverse plane; and

means for adjustably supporting said lower deflector in fixed position but at a predetermined acute angle between about 20° and 40° relative to a central transverse plane bisecting said die in the direction of rotation of the adjacent die portion.

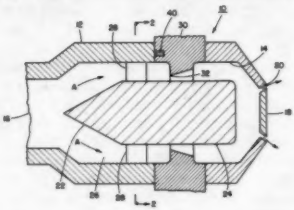
4,711,623

ANNULAR EXTRUSION DIE WITH INTERNAL CHOKE RING AND SPIDER MANDREL

Jonathan Gross, Canandaigua, and O. James Marten, Stanley, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 13, 1986, Ser. No. 862,729
Int. Cl.[4] B29C *47/20*
U.S. Cl. 425—376 A 8 Claims

1. An annular extrusion die for the extrusion of a thermoplastic material, such as foamed plastic and the like, comprising a die body having an elongated cylindrical cavity having one end communicating with a source of thermoplastic melt and with an extrusion die orifice for extruding tubular product at the opposite end thereof; an elongated cylindrical mandrel centrally arranged within said cavity and defining and elongate annular flow passageway therebetween; a plurality of circumferentially spaced said spider means extending radially across said flow passageway for fastening said mandrel to said die body; and a choke ring interposed in said annular flow passageway downstream of said spider means to form an annular restriction in the cross-section of said flow passageway and producing a back pressure on the thermoplastic material upstream of said restriction, said choke ring having a land extending in the flow direction of said passageway, said land having



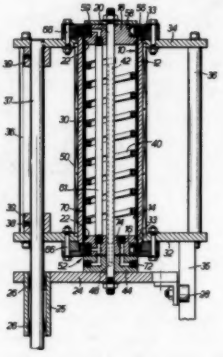
a height extending parallel to said flow direction of said passageway and said land continually varying in height about the circumference thereof so as to impart a predetermined varying back pressure distribution along the circumference of said restriction to the thermoplastic material conveyed through said restriction.

4,711,624

APPARATUS FOR HEAT-SETTING A TUBULAR ARTICLE OF CRYSTALLIZABLE POLYMER

Martin J. Watson, Wantage, England, assignor to Metal Box p.l.c., Reading, England

Filed Mar. 7, 1986, Ser. No. 837,533
Claims priority, application United Kingdom, Mar. 18, 1985, 8506932
Int. Cl.[4] B29C *55/22*
U.S. Cl. 425—384 11 Claims



1. Apparatus for heat setting a preformed thermoplastic tubular article of a crystallisable polymer, which is open at both ends and which will be dimensionally stable up to a specific elevated temperature, comprising a mandrel, cooling means for cooling the mandrel to a temperature below the glass transition temperature of the tubular article, a mould having a cavity of complementary shape to that of the mandrel and surrounding the mandrel with a small clearance between the mandrel and mould, heating means for heating the mould to a temperature higher than said specific elevated temperature, clamping means for clamping each end of said article between the mandrel and mould for axially restraining said article and expansion means for elastically expanding the tubular article into contact with the mould.

4,711,625

NOZZLE CARTRIDGE FOR INJECTION MOLDING

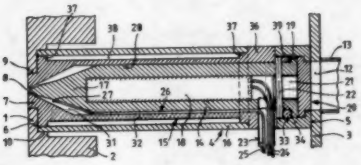
Joachim F. Knauer, Deuil la Barrestr. 17, 6000 Frankfurt, Fed. Rep. of Germany (6000), and Martin Freimuth, Downey, Calif., assignors to Joachim F. Knauer, Frankfurt, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,933

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525735; Dec. 19, 1985, 3545017

Int. Cl.[4] B29C *45/20*

U.S. Cl. 425—549 18 Claims



1. In a hot-runner injection-molding machine including a nozzle cartridge installed between a wall delimiting a mold cavity and a counter platen, the nozzle cartridge having a shell and a spreader supported in the shell terminating in a pointed configuration at an outlet region of the nozzle cartridge, the improvement comprising:

a spreader having front and rear ends;

a shell extending over the spreader up to said rear end of the spreader and having front and rear end portions;

a planar rear end face on said rear end portion of the shell for abutting engagement with a planar region on the counter platen;

a forwardly projecting extension on said front end portion of the shell having a step shape with at least one cylindrical surface thereon engageable in an opening in the wall delimiting the mold cavity, said opening communicating with the mold cavity;

a nozzle opening in said forwardly projecting extension;

a pointed tip on said front end of the spreader disposed in said nozzle opening;

an entry fitting at the rear of the spreader extending radially through the shell and having a passage therein;

a heating means being provided in said spreader having power leads extending through said passage;

a temperature sensor hole provided through the entry fitting; and

a temperature sensor sheath containing a temperature sensor being provided extending between said spreader and said shell to the outlet region from the temperature sensor hole and said passage;

the nozzle-cartridge being in contacting engagement with other parts of the machine only at said at least one cylindrical surface and said planar rear end face on said shell.

4,711,626

DAMPER MOUNTING ASSEMBLY

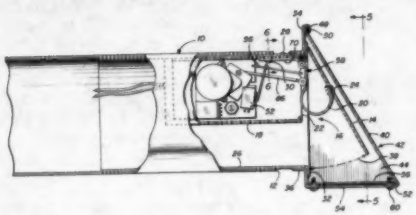
Clifford L. Hoyme, P.O. Box 1485, Camrose, Alberta, Canada (T4V 1X3)

Continuation-in-part of Ser. No. 506,882, Jun. 21, 1983, Pat. No. 4,538,980, which is a continuation-in-part of Ser. No. 225,729, Jan. 15, 1981, Pat. No. 4,426,993. This application Jun. 18, 1985, Ser. No. 746,187

Int. Cl.[4] F24C *3/00*

U.S. Cl. 431—20 14 Claims

1. In combination with an elongated duct having an open end, a damper element and an operating unit having pivot means for suspending the damper element and transmitting means operatively connected to the damper element for signal controlled movement thereof from a closed position to an open position, installational means for mounting the operating unit and the damper element on the duct, said installational means comprising a housing protectively enclosing the operating unit, means for supporting the housing within the duct with the pivot means projecting from the housing through the open end of the duct, sealing means connected to the supporting means independently of the pivot means and spaced externally of the



duct for engagement by the damper element in the closed position thereof and a hood mounted on the sealing means in enclosing relation to the damper element, said hood having an opening aligned with a plane transverse to the open end of the duct.

4,711,627

DEVICE FOR THE THERMAL SPRAY APPLICATION OF FUSIBLE MATERIALS

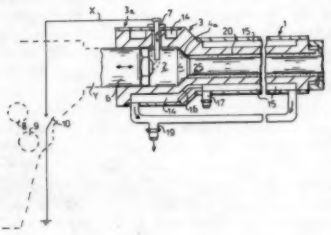
Manfred Oeschsle, Bad Homburg; Uwe Szieslo, Waldems; Karl-Peter Streb, Markt Mombria, all of Fed. Rep. of Germany, and Wolfgang Simm, Ecublens, Switzerland, assignors to Castolin S.A., Lausanne, Switzerland

PCT No. PCT/DE84/00173, § 371 Date Apr. 24, 1985, § 102(e) Date Apr. 24, 1985, PCT Pub. No. WO85/00991, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 27, 1984, Ser. No. 731,999

Int. Cl.[4] F23N *5/00*; F23C *5/06*

U.S. Cl. 431—30 14 Claims



1. A device for the thermal spray application of a fusible material, which comprises

(a) a nozzle defining an elongated, axially extending spray channel,

(b) an inlet leading to said spray channel and coaxial therewith, the inlet having a flow-accelerating contour,

(c) a combustion chamber leading to the inlet and coaxial therewith, the combustion chamber having a diameter larger than that of the spray channel,

(d) a nozzle head displaceably mounted in the combustion chamber and axially adjustable with respect to the inlet, the nozzle head carrying

(1) a burner nozzle,

(2) respective conduit means for feeding a combustion gas and a spray channel flushing gas into the combustion chamber, and

(3) means for feeding the fusible material into the combustion chamber,

(e) an ignition electrode projecting into the combustion chamber and being arranged for adjustment with respect

to the burner nozzle in a direction transverse to the axis, and

(f) a control circuit controlling the feeding of the combustion gas and the feeding of the flushing gas through the respective conduit means, the control circuit including

(1) a switching element for supplying electric current to the ignition electrode whereby a spark is formed between the ignition electrode and the burner nozzle for igniting the combustion gas in the combustion chamber, the control circuit being arranged to actuate the switching element for supplying the electric current to the ignition electrode after feeding the flushing gas and prior to feeding the combustion gas.

4,711,628

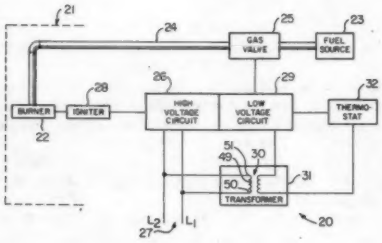
HOT SURFACE IGNITION SYSTEM FOR A GAS FURNACE AND METHOD OF MAKING THE SAME

Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 18, 1986, Ser. No. 887,860

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—31 **17 Claims**



1. In a hot surface ignition system for a gas furnace and comprising a high voltage circuit for being connected to a source of high voltage AC current, said high voltage circuit having a hot surface igniter means therein and disposed in the path of gas issuing from a burner means that is adapted to be fed said gas from a source thereof through an electrically operated gas valve, a low voltage circuit for being connected to a source of low voltage AC current, said low voltage circuit having said gas valve therein and having thermostatic switch means therein controlling the energization of said low voltage circuit with said low voltage AC current, first relay means having contact means in said high voltage circuit and controlling the energization of said igniter means with said high voltage AC current, and other relay means having contact means in said low voltage circuit and controlling the energization of said gas valve, the improvement wherein said other relay means comprises two separate relays respectively having contact means that are disposed in series in said low voltage circuit whereby the contact means of said two relays must be in the same condition thereof to energize said gas valve.

4,711,629

FLARE STACK IGNITOR

Roderick J. MacDonald, #8, Site 14, R.R. #1, Red Deer, Alberta, Canada T4N 5E1

Filed Jul. 25, 1985, Ser. No. 758,689

Claims priority, application Canada, Jan. 8, 1985, 471702

Int. Cl.[4] F23Q *3/00*

U.S. Cl. 431—264 **1 Claim**

1. A flare stack ignitor comprising a pair of hollow elongated electrodes movably mounted on a flare stack, each of said electrodes including venturi means comprising a casing member having a hollow upper section telescopically mounted in a hollow lower section, an electrical insulator between said upper and lower sections for electrically isolating said sections, said lower section including means for securing said casing to a support, said upper section having an open upper end and including means for connecting said upper section to an electric circuit for generating a spark between said electrodes, said upper section further including a venturi member having a central axial duct portion axially aligned in said upper section and a plurality of radially spaced radially extending duct portions inclined downwardly and away from said upper section for drawing combustion air into said central axial duct portion and conveying said air to the open upper end of said upper section, said electrodes being so connected to said electric circuit and so positioned with respect to each other as to create a spark therebetween for igniting gases in said flare stack.

4,711,630

DENTAL HANDPIECE ASSEMBLY

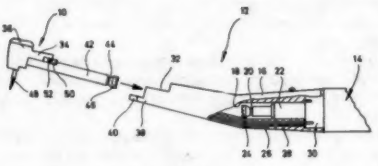
Walter Dürr, Bulachweg 14, 7250 Leonberg (Warmbronn), Fed. Rep. of Germany

Filed Apr. 8, 1986, Ser. No. 849,405

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 8510667[U]

Int. Cl.[4] A61C *1/10*

U.S. Cl. 433—82 **10 Claims**



1. A dental assembly which comprises:

(a) a handgrip having front and rear ends,

(b) a handgrip shaft having front and rear ends, the rear end thereof being adapted to be connected to a motor unit,

(c) a headpiece having front and rear ends, the rear end thereof being detachably connected to the front end of said handgrip in a partially overlapping manner,

(d) a headpiece shaft having front and rear ends mounted within said headpiece,

(e) tool holding means adapted to receive a dental tool and being connected to the front end of the headpiece shaft so that a tool inserted therein will face downwardly,

(f) the front end portion of said handgrip including an arm portion which engages from below an overlying face of said headpiece that faces downwardly in the same direction that an inserted dental tool faces,

(g) at least two pairs of outlets for cooling water and cooling air, said outlets being located near the front end of said

handgrip in an area closely adjacent to the axis of an inserted dental tool, said outlets being circumferentially staggered about the axis of an inserted dental tool, and

(h) at least one of said pairs of outlets for cooling water and cooling air being arranged to exit downwardly from said arm portion of said handgrip and in generally the same direction that an inserted dental tool faces, so that said outlets for cooling water and air are close to an inserted tool axis but do not belong to the detachable headpiece.

4,711,631

ARRANGEMENT FOR JOINING DENTURE COMPONENTS BY ADHESION (DEVICE FOR BINDING PARTS OF DENTAL PROSTHESIS BY ADHESION)

Peter K. Thomsen, Wiesenweg 7, 2300 Molfsee/Schulensee, Fed. Rep. of Germany

PCT No. PCT/EP84/00348, § 371 Date Jun. 28, 1985, § 102(e) Date Jun. 28, 1985, PCT Pub. No. WO85/01872, PCT Pub. Date May 9, 1985

PCT Filed Nov. 2, 1984, Ser. No. 756,971

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3340016; Sep. 4, 1984, 3432486

Int. Cl.[4] A61C *13/22*

U.S. Cl. 433—181 **12 Claims**

1. An arrangement for joining denture components to be located laterally with respect to one another comprising:

a pair of joining elements (1,6) each one of the elements being connectable at one end to one of the components to be joined, and joined at their other ends to each other by interengagement of an internal part having an outer surface (11) and an external part having an inner surface (10), at least a portion of the inner surface being undercut with respect to the joining and loosening direction and at least a portion of the outer surface having a shape complementary to the undercut, the engagement of the internal and external parts enclosing an intermediate space (12) therebetween which permits adjustment of the components to be joined (13; 17, 18; 17, 21) during assembly of the arrangement, the intermediate space being filled with a hardening sealing compound, whereby after the compound has hardened, the inner and outer surfaces act in a positive manner to apply a compressive force on the sealing compound against the portions of the surface which are undercut in respect of the loosening direction to prevent loosening therebetween.

4,711,632

COMPATIBILITY/INCOMPATIBILITY FORECASTING DEVICE

Jeffrey C. Detrick, P.O. Box 3155, Shawnee Mission, Kans. 66203

Filed Jul. 30, 1986, Ser. No. 891,779

Int. Cl.[4] G09B *19/00*

U.S. Cl. 434—106 **9 Claims**

1. An educational/forecasting astrological device making use of the twelve astrological signs, said device consisting essentially of:

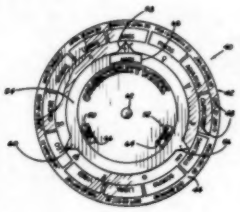
a flat central section having a pair of opposed faces;

first and second flat members rotatably mounted to said central section and respectively in proximal, face-to-face relationship with one of the faces of said central section, said central section, and said first and second members, each being cooperatively configured to expose a portion of each of the faces of said central section,

said central section and first and second members rotatably mounted thereto cooperatively presenting first and second opposed side surfaces, each of said side surfaces being defined by a outer face of the corresponding member remote from said central section, and an exposed portion of an adjacent face of said central section;

indicia means on said first side surface including, on one of said first member outer face and said exposed portion of the adjacent face of the central section, three spaced apart compatibility indicator means located in fixed relationship to each other, and, on the other of said first member outer face and the exposed portion of the adjacent face of the central section, astrological indicia representing the twelve astrological signs,

said three indicator means being oriented with respect to said first side surface astrological indicia for alignment of the three indicator means with four respective three-membered sets of said first side surface astrological indicia upon relative rotation between said central section and first member;



indicia means on said second side surface including, on one of said second member outer face and said exposed portion of the adjacent face of the central section, four spaced apart incompatability indicator means located in fixed relationship to each other, and, on the other of said second member outer face and exposed portion of the adjacent face of the central section, astrological indicia representing the twelve astrological signs,

said four indicator means being oriented with respect to said second side surface astrological indicia for alignment of the four indicator means with three respective four-membered sets of said second side surface astrological indicia upon relative rotation between said central section and second member.

4,711,633

INSTRUCTIONAL DEVICE FOR TENNIS PLAYERS

Michael A. Dombrowski, 1330 5th Ave., NE., 187 Tara Woods, Hickory, N.C. 28603, and Nancy M. Eikeland, Brevard, N.C., assignors to Michael A. Dombrowski, Hickory, N.C.

Filed Mar. 31, 1986, Ser. No. 846,006

Int. Cl.[4] G09B *1/22*

U.S. Cl. 434—247 **10 Claims**

1. An instructional device for tennis players comprising: a base member; first indicia on said base member indicating a plurality of stroke problems related to plurality of different strokes; second indicia on said base member indicating the possible cause or causes of each said stroke problem; a second member movably secured to said base member and having a first window for alignment with said first indicia and a second

window for alignment with said second indicia whereby when a player aligns said first window with a selected stroke problem indicia, corresponding cause indicia will be visible through said second window.

4,711,634

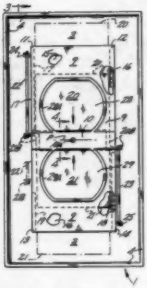
WALL OUTLET COVER PLATE ASSEMBLY

Wayne L. Antone, II, 89864 Terretorial Rd., Elmira, Oreg. 97437, and Dennis C. Finnell, 26732 Patterson Dr., Monroe, Oreg. 97456

Continuation-in-part of Ser. No. 822,835, Jan. 27, 1986, abandoned. This application Nov. 3, 1986, Ser. No. 926,334

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—136 **5 Claims**



1. A wall outlet cover plate assembly for attachment to a wall mounted electrical wall outlet having a pair of sockets, said cover plate assembly comprising in combination,

a cover plate defining plug receiving openings,

guide means in place on said cover plate and defining with said cover plate a pair of guideways.

closures for said plug receiving openings one each slidably confined in each of said guideways, said closures adapted for independent finger actuated sliding movement away from a transverse medial plane of the cover plate, and

tensionable members having fixed and movable ends the latter coupled to each of said closures and biasing same toward said medial plane to close the plug receiving openings to the cover plate, the fixed end of each tensionable member being located on one side of said medial plane opposite from the closure biased thereby located on the remaining side of the medial plane.

4,711,635

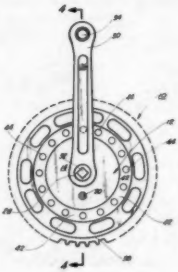
QUICK CHANGE SELF-OILING SPROCKET HUB

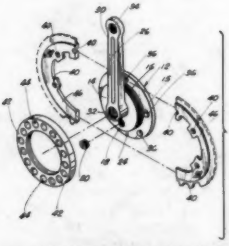
John W. Arnce, Wichita, Kans., assignor to Richard Lee Plush, Jr., Topeka, Kans.

Filed Sep. 10, 1985, Ser. No. 774,487

Int. Cl.[4] F16H *55/30*

U.S. Cl. 474—152 **23 Claims**





1. A quick change self-oiling sprocket hub comprising a hub means including a first ring means having an essentially hollow structure with a threaded circumference and defining an oil input aperture for filling the hollow structure with oil and an oil discharge aperture for dispensing oil, and a second ring means concentrically integrally bound to the first ring means and having a greater diameter than said first ring means, such that the overlap of the second ring means to the first ring means defines a second ring flange means:

at least one locating pin means secured to said second ring flange means for releasably holding at least one sprocket means to said second ring flange means; and

a compressor ring retainer means with a plurality of ring apertures circumferentially disposed on its perimeter and threadably engaged to the threaded circumference of the first ring means.

4,711,636

CATHETERIZATION SYSTEM

Steven F. Bierman, 143 Eighth St., Del Mar, Calif. 92014

Filed Nov. 8, 1985, Ser. No. 796,301

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—180 **20 Claims**

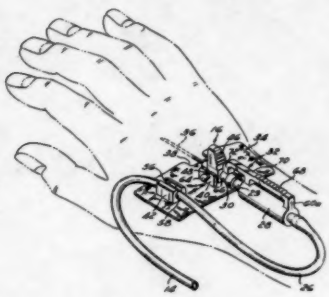
1. A catheterization system adapted for insertion into the arm, hand, or other location in the body of a patient for delivering fluids through a conduit to said patient, comprising:

a cannula for insertion into said patient at a particular location, said cannular passing said fluids into said patient, the proximal end of said cannula having means for receiving said conduit;

means for adapting said conduit for engagement with said receiving means on said cannula, said adapting means being rotatable with respect to said receiving means to

relieve rotational forces in said conduit, said adapting means insulting said cannula from rotational movement of said conduit in order to avoid injury or discomfort to said patient; and

means for mounting said cannula on said patient, said mounting means comprising snap-fit engagement means with said cannula for removably anchoring said cannula on said



patient, said removable snap-fit engagement obviating the necessity for the time-consuming application of surgical tape or other apparatus,

said adapting means being solely engageable and disengageable with said receiving means on said cannula in order to facilitate the frequent replacement of said conduit without requiring the removing of said cannula from said mounting means.

4,711,637

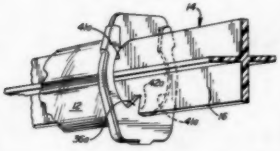
SYRINGE LOCK

Harold G. Leigh, Creve Coeur, and Eli Schachet, St. Louis, both of Mo., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 4, 1986, Ser. No. 825,823

Int. Cl.[4] A61M *5/315*

U.S. Cl. 604—220 **12 Claims**



1. A lock for a syringe, which comprises:

a single sheet of generally U-shape, said sheet defining a central, cutaway portion extending through the edge of said sheet, and attachment means positioned on said sheet, whereby a syringe plunger comprising radially extending vanes can be placed to extend through the central, cutaway portion, and the attachment means may be secured to a syringe barrel which carried the plunger so that rotation of the plunger in one direction causes at least one sheet edge portion defining the central, cutaway portion to dig into a vane of the plunger, to cause retention of the plunger and barrel in a fixed position relative to each other, and rotation of the retained plunger in the opposite direction frees the plunger from its retained relation, the attachment means comprising a foldable first and second tab positioned respectively at the end of each arm of saud U-shaped sheet, and a third foldable tab positioned at the end of said sheet opposed to said first and second tabs.

4,711,638

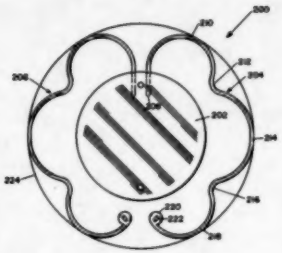
INTRAOCULAR LENS

Richard L. Lindstrom, 1065 W. Ferndale Rd., Wayzata, Minn. 55391

Filed May 12, 1986, Ser. No. 861,707

Int. Cl.[4] A61F *2/16*; A61B *17/00*

U.S. Cl. 623—6 **5 Claims**



1. Intraocular lens comprising:

a. lens optic; and

b. two haptic loops, said haptic loops secured substantially adjacent to each other near a common point of securement at an edge of said lens optic and extending outwardly from said edge at an increasing angle, said haptic loops being symmetrical, double-opposing, cantilevered, compressible and mirror images of each other extending from said point of securement around and about said edge of said lens to a point substantially diametrically opposed from said point of securement for symmetrically supporting said lens in said eye, and each of said haptic loops including three semi-circular segments and two inward curved segments connecting each of said semi-circular segments together.

4,711,639

ANCHORAGE FOR TIBIA PLATES

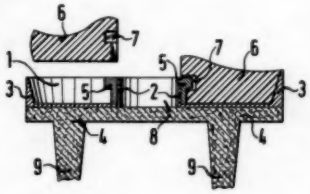
Hans Grundei, Lübeck, Fed. Rep. of Germany, assignor to S+G Implants GmbH, Lubeck, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,577

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433264

Int. Cl.[4] A61F *2/38*

U.S. Cl. 623—20 **4 Claims**



1. An anchorage for plastic tibia plates of a knee joint endoprosthesis, said anchorage disposed in an upper part of a shin bone on both sides of a central web or ridge therof extending from the front of the knee joint towards the rear thereof, said central web or ridge having parallel planar side faces, said anchorage comprising a metal tray for carrying a tibia plate, the tray being provided on the base thereof with a metallic open-cell layer permitting growth of bone tissue into the cells thereof, and the tray having a planar wall perpendicular to the base thereof and bearing against one of said planar side faces of the central web or ridge, which planar wall is provided on the inside surface thereof with a T-shaped projection, and a cone-

shaped arcuate side wall the thickness of which increases conically on the inside of the tray from top to bottom of the tray, the tibia plate having a conical profile that matches the profile of the inner surface of the tray and being provided with a flat base and a planar side wall perpendicular to the flat base and having a T-shaped recess facing and matching the T-shaped projection of said planar wall of the tray, the tibia plate being engageable with the tray so that the tibia plate can be firmly and detachably fitted into the tray of said anchorage.

4,711,640

PROCESS FOR CROSSDYEING CELLULOSIC FABRICS

Robert J. Harper, Jr., Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 25, 1986, Ser. No. 878,106
Int. Cl.[4] D06P *5/00*
U.S. Cl. 8—481 23 Claims

1. A process for crossdyeing a cellulosic fabric comprising:
(a) treating preselected areas of a cellulosic fabric with an aqueous cationic solution of sufficient concentrations of: N-methylol crosslinking agent, acid catalyst and a choline quaternary, and drying and curing said fabric for sufficient time and temperature to impart cationic properties to said treated areas of fabric;
(b) immersing the fabric in an acidic dyebath containing an anionic dye for sufficient time to allow the anionic dye to react with the cationic areas and thereby produce a fabric which is dyed only in the treated areas and washing the fabric to remove unreacted dyestuffs from the fabric; then,
(c) immersing the fabric in an alkaline dyebath containing a reactive dyestuff of different color than that of step (b) for sufficient time to dye the fabric and thereby produce a bicolored fabric.

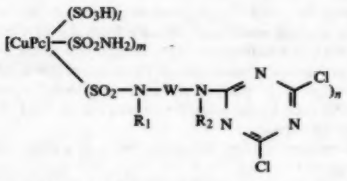
4,711,641

REACTIVE DYE COMPOSITION: MIXTURE OF REACTIVE COPPER PHTHALOCYANINE DYES: DICHLORO-TRIAZINYL DYE AND VINYL SULPHONYL TYPE DYE

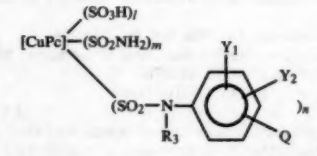
Toshio Nakamatsu, Ibaraki; Tetsuya Miyamoto, Takatsuki, and Kunihiko Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 12, 1986, Ser. No. 839,030
Claims priority, application Japan, Mar. 29, 1985, 60-67161
Int. Cl.[4] C09B *62/10, 67/22;* D06P *1/38*
U.S. Cl. 8—524 9 Claims

1. A reactive dye composition, which comprises a phthalocyanine dye represented by a free acid of the following formula (I),



wherein CuPc is a copper phthalocyanine nucleus, W is a C_2–C_4 alkylene group or a 1,3- or 1,4-phenylene group having one or two sulfo groups, R_1 and R_2 are independently a hydrogen atom or a lower alkyl group, l is a number of 1 to 3, m is a number of 0 to 2, and n is a number of 1 to 3, provided that the total number of l, m and n is 4 or less, and a phthalocyanine dye represented by a free acid of the following formula (II),



(II)

wherein CuPc, l, m and n are as defined above, Y_1 and Y_2 are independently a hydrogen atom or a methyl, methoxy or sulfo group, R_3 is a hydrogen atom or a lower alkyl group, and Q is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Z$ in which Z is a splittable group by the action of an alkali, the mixing weight ratio of the dyes (I) to (II) in terms of a copper content being from 80 through 20 to from 20 through 80.

4,711,642

LIQUID, WATER CONTAINING MONO-FLUORO-TRIAZINYL REACTIVE DYESTUFF PREPARATION WITH PH 8–12

Joachim Wolff, Bergisch Gladbach, and Karlheinz Wolf, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,352
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534729
Int. Cl.[4] C09B *67/00, 67/26, 62/04;* D06P *1/382*
U.S. Cl. 8—527 11 Claims

1. A liquid water-containing preparation of reactive dyestuffs with a monofluorotriazinyl reactive radical, characterized by a pH value of at least 8.

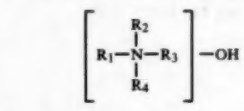
4,711,643

STABILIZED COAL OIL MIXTURES

Paul C. Kemp, Catlettsburg, and Walter Lyons, Ashland Ricky E. Music, Catlettsburg, are of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 14, 1981, Ser. No. 331,444
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 8 Claims

1. A stable, combustible coal-oil mixture comprising
about 30 to about 50% by weight of a solid particulate carbonaceous material,
a liquid hydrocarbon fuel,
about 0.05 to 5.0% by weight of a stabilizer having the following structural formula:



wherein R_1, R_2, R_3 and R_4 are alkyl groups having from 1 to 25 carbon atoms.

4,711,644

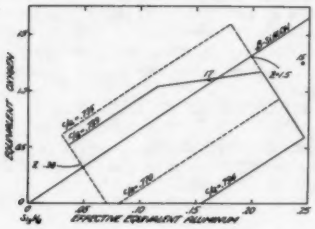
CERAMIC MATERIAL AND METHOD OF MANUFACTURE

Russel L. Yeckley, Oakham, Mass., and Bernard North, Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 867,910, May 23, 1986, abandoned, which is a continuation of Ser. No. 800,955, Nov. 22, 1985, abandoned, which is a division of Ser. No. 466,716, Feb. 15, 1983, Pat. No. 4,563,433, which is a continuation-in-part of Ser. No. 351,289, Feb. 22, 1982, abandoned. This application Nov. 3, 1986, Ser. No. 926,849
Int. Cl.[4] C04B *35/58*
U.S. Cl. 51—307 7 Claims

1. A metalcutting insert made by the method of producing a ceramic product, comprising the steps of forming a powder mixture consisting essentially of a first component consisting of compounds containing the elements of silicon, aluminum, oxygen and nitrogen in proportions such that the ratio of the total number of silicon and aluminum atoms to the total number of oxygen and nitrogen atoms lies in the range 0.735 to 0.77 and such that said compounds react together with the second component during the subsequent sintering process to produce a double phase ceramic material wherein a first phase obeys the general formula: $Si_{6-z}Al_zO_zN_{8-z}$ where z is between 0.38 and 1.5; wherein a second phase obeys the general formula $(Si, Al)_{12}M_x(O, N)_{16}$; and wherein up to 10 percent by weight of a second component is in the form of an oxide of at least one of the further elements, yttrium, scandium, cerium, lanthanum and the metals of the lanthanide series; and wherein sintering

said mixture in a non-reactive environment comprises placing said mixture in a graphite pot and covering with a mixture of boron nitride and silicon nitride powders while surrounding said graphite pot and said silicon nitride and boron nitride powders with a nitrogen gas, with or without the application of pressure, at a temperature between 1600 degrees Centigrade



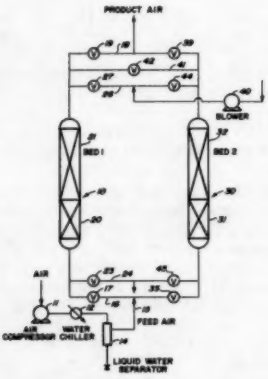
and 2000 degrees Centigrade and for a time, decreasing with increasing temperature, of at least ten minutes to at least five hours so as to produce a ceramic material containing said double phase ceramic material together with a second phase containing said at least one further element, which is a glassy phase.

4,711,645

REMOVAL OF WATER AND CARBON DIOXIDE FROM ATMOSPHERIC AIR

Ravi Kumar, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 10, 1986, Ser. No. 828,008
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **7 Claims**



1. The method of removing moisture and carbon dioxide from atmospheric air which comprises the steps of:

(a) passing the air at an inlet temperature in the range of about 70°–120° F. and at an inlet pressure in the range of about 50 to 150 psia through a first bed of adsorbent selective in removal of water from an air stream and then through a second bed of adsorbent effective in selective removal of carbon dioxide; then regenerating said first and second adsorbent beds by

(b) reducing the pressure in said beds by gas withdrawal therefrom in a direction opposite that of step (a) to about atmospheric pressure level;

(c) and at the attained pressure level of step (b) purging both said beds with a gas stream freed of water and carbon dioxide, said gas stream being introduced into and passed through said second bed into and through said first bed; followed by

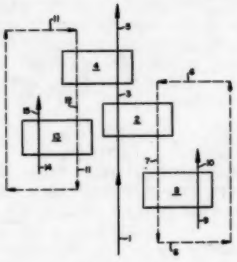
(d) repressuring both said beds to a level in the range of 50–150 psia with product gas freed of water and carbon dioxide, passed into said beds in the same flow direction as step (c).

4,711,646

SINGLE COMPONENT ADSORPTION PROCESS

Arun Acharya, East Amherst, and William E. Bevier, Kenmore, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 796,102, Nov. 8, 1985, abandoned. This application Mar. 26, 1987, Ser. No. 30,705
Int. Cl.[4] B01D *53/04, 53/06*
U.S. Cl. 55—33 **20 Claims**



1. A process for the removal by adsorption of a single component from a gaseous stream comprising:

(a) passing a gaseous stream containing a component to be removed in contact with a first mass of adsorbent to transfer the majority of said component to the first mass of adsorbent and reduce the concentration of said component in the gaseous stream to within the range of from 5 to 50 ppm;

(b) passing the resulting gaseous stream in contact with a second mass of adsorbent, separate from the first mass of adsorbent, to transfer remaining component to the second mass of adsorbent and reduce the concentration of said component in the gaseous stream to less than 5 ppm;

(c) loading each of the adsorbent masses to at least 90 percent of its capacity;

(d) regenerating the first adsorbent mass to a high residual loading; and

(e) regenerating the second adsorbent mass to a low residual loading.

4,711,647

PROCESS AND APPARATUS FOR DEGASSING LIQUIDS, ESPECIALLY POLYMER MELTS AND SOLUTIONS

Egon Gathmann, Remscheid, Fed. Rep. of Germany, assignor to Barmag Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 855,094
Claims priority, application Fed. Rep. of Germany, May 2, 1985, 3515785; Aug. 20, 1985, 3529708
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—52 **15 Claims**

1. In a process for the degassing of liquids, including polymer melts and solutions, to be processed or manufactured into finished products, the improvements which comprises:

conveying the liquid as a pressure-independent stream, which contains pressure-releasable impurities of substantially lower boiling point, under expansion of pressure for introduction into the feed chamber of a gear wheel pump having paired gear wheels oppositely rotating with an

upwardly opening nip which transports said liquid outwardly and then downwardly into an entry zone formed between an outer circumferential part of each gear wheel and the adjacent peripheral wall of the pump, said liquid being introduced at a pint located directly above said opening nip in said feed chamber;

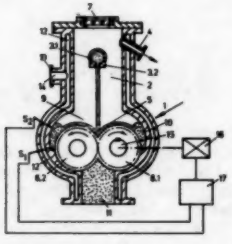
withdrawing from the feed chamber the impurities which are released as a gas by said expansion;

allowing the liquid to flow under the influence of gravity to form a pool on the gear wheels of the pump as the liquid is transported outwardlly by said gear wheels into said entry zone and then downwardly to an exit zone of higher pressure; and

controlling the filling position of the liquid pool in the feed chamber to a partial filling such that only a thin melt film forms on the upper circumference of the gear wheels.

11. Apparatus for the degassing of high-boiling liquids, including polymer melts and solutions, to remove substantially lower boiling liquids and gases as impurities therefrom, which apparatus comprises:

a gear wheel pump having a housing with liquid inlet and liquid outlet lines connected thereto, said housing enclosing paired gear wheels disposed betweeen the inlet and outlet lines, said gear wheels being engaged for opposite rotation with an upwardly opening nip facing a feed



chamber arranged above said gear wheels on the inlet side of the housing, and each of said gear wheels forming a liquid entry pocket between an outer circumferential part of the wheel and the adjacent peripheral wall of said feed chamber;

nozzle means to introduce liquid under release of pressure into said feed chamber at a point which lies above the upwardly opening nip of the paired gear wheels, allowing the liquid to flow downwardly under the influence of gravity onto said gear wheels;

means to oppositely rotate said gear wheels upwardly and outwardly from the opening nip to transport liquid outwardly and the downwardly into said entry pocket while passing the liquid from said inlet side under increasing pressure to said outlet line;

regulating means to control the relative rate of introduction of the liquid with reference to its rate of transport by the gear wheels such that the liquid level in the feed chamber is maintained at a preset level only partially filling said feed chamber; and

a pressure relief connection on said feed chamber at a position upstream from the preset liquid level and far enough away from the liquid inlet for removal of the impurities in gas form without removing any significant portion of the liquid.

4,711,648

PROCESS FOR PURIFICATION OF GASES

Werner Konkol, Oberhausen; Helmut Bahrmann, Hamminkeln-Brünen; Georg Dämbkes, Dinslaken; Wilhelm Gick, Duisburg; Ernst Wiebus, Oberhausen, and Hanswilhelm Bach, Duisburg, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,455

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532955

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—73 **19 Claims**

1. A process for the removal of at least one contaminant selected from the group consisting of hydrogen sulfide, carbonyl sulfide and hydrogen cyanide from a gas containing the same comprising contacting said gas with at least one liquid aliphatic aldehyde at a temperature of 30° C.–100° C. to absorb the contaminant(s) from the gas, said gas being inert to the aldehyde and recovering the contaminant depleted off gas.

4,711,649

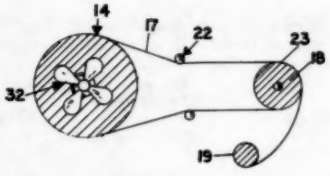
AIR FILTER AND METHOD

Robert A. Berryhill, Stokesdale, N.C., assignor to Austin-Berryhill Fabrication, Inc., Greensboro, N.C.

Filed Sep. 2, 1986, Ser. No. 902,492

Int. Cl.[4] B01D *46/20*

U.S. Cl. 55—97 **14 Claims**



1. A filter comprising: a filter medium support drum, a filter medium supply positioned proximate said support drum, a take-up roller positioned proximate to said filter medium supply and filter medium extending from said medium supply over said support drum and back into engagement with said medium supply and thereafter onto said take-up roller.

4,711,650

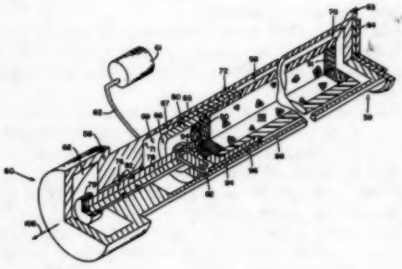
SEAL-LESS CRYOGENIC EXPANDER

Lawrence E. Faria, Hudson, and Earl H. Christopher, Lynnfield, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 4, 1986, Ser. No. 903,540

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 **20 Claims**



1. In an expander for use in a split Stirling cycle refrigeration system of the type wherein a displacer moves with reciprocat-

ing motion inside an expander housing, and wherein a plunger force and a regenerator force are formed on the displacer, the plunger force cyclically varying and having a time of minimum and maximum plunger force amplitude, and the regenerator force cyclically varying and having a time of minimum and maximum regenerator force amplitude, the improvement comprising:

(a) means for maintaining displacer forces, such that the maximum plunger force amplitude is substantially equal to the maximum regenerator force amplitude; and

(b) means for adjusting a time difference, the time difference being the time between the time of maximum plunger force and the time of maximum regenerator force such that a measure of the cooling power of the refrigeration system is maximized.

4,711,651

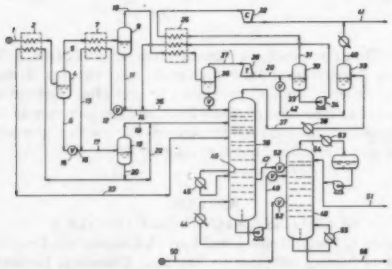
PROCESS FOR SEPARATION OF HYDROCARBON GASES

Shanmuk Sharma, Houston; Donnie K. Hill, Woodlands, and Charles A. Durr, Houston, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Dec. 19, 1986, Ser. No. 944,274

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—34 **9 Claims**



1. A process for separation of a high pressure gaseous stream containing mixed light hydrocarbons which comprises:

(a) cooling the high pressure gaseous stream and introducing the resulting cooled high pressure stream to a first, single equilibrium, separation zone;

(b) recovering a first vapor stream and a separate first liquid stream from the first, single equilibrium, separation zone;

(c) expanding the first liquid stream to form a first intermediate pressure stream;

(d) cooling the first vapor stream and introducing the resulting cooled stream to a second, single equilibrium, separation zone operated at substantially the same pressure as the first, single equilibrium, separation zone;

(e) recovering a second liquid stream from the second, single equilibrium, separation zone;

(f) expanding at least a major portion of the second liquid stream to form a second intermediate pressure stream;

(g) combining the first and second intermediate pressure streams to form a mixed intermediate pressure stream; and

(h) recovering refrigeration from at least a portion of the mixed intermediate pressure stream.

4,711,652

METHOD OF PRODUCING HALIDE GLASS, ESPECIALLY FOR OPTICAL COMMUNICATIONS

Giacomo Roba, Genova, and Eros Modone, Turin, both of Italy, assignors to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 17, 1986, Ser. No. 840,422

Claims priority, application Italy, Apr. 3, 1985, 67325 A/85

Int. Cl.[4] C03B *19/06, 37/018*

U.S. Cl. 65—18.2 **5 Claims**

1. A process for manufacturing a halide glass which comprises the steps of:

reacting an organometallic compound selected from the group which consists of:

$(CH_3)_3Al$, $(C_2H_5)_3Al$, $(CH_3)_2AlCl$,

$(C_2H_5)Sn$, $(C_2H_5)_2AlCl$, $(CH_3)_4Pb$ and $(C_2H_5)_4Pb$;

with an interhalide or halide-derived compound selected from the group which consists of:

$CHCl_3$, C_7F_{14}, C_6H_5F, $C_6H_{11}F$,

$ClCH_2CH_2Cl$, CH_2Cl_2, CH_3CHCl_2, IF_5, ICl_3, and ICl,

in liquid phase, in amounts and at a temperature at which a glass-forming solid salt is precipitated and all remaining elements of the reacted compounds are volatilized as reaction products; and

vitrifying said glass-forming solid salt to form a glass article.

4,711,653

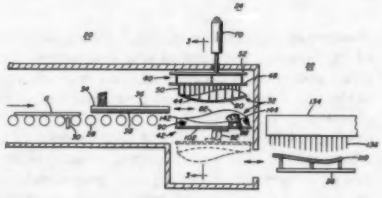
INNOVATIVE PRESS BENDING OF THERMOPLASTIC SHEETS

Robert G. Frank, Franklin Township, Butler County; George R. Claassen, New Kensington; Thomas L. Waterloo, Allison Park; Stephen J. Schultz, Indiana Township, West Moreland County, and Michael T. Fecik, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1986, Ser. No. 947,253

Int. Cl.[4] C03B *23/03*

U.S. Cl. 65—106 **24 Claims**



1. An apparatus for shaping heat softened sheet material comprising:

means to heat said sheet to its heat softening temperature;

a shaping station including an upper mold with a downwardly facing shaping surface and a lower vacuum mold with an apertured upwardly facing shaping surface wherein said upwardly facing shaping surface complements said downwardly facing shaping surface;

means to provide a vacuum to said lower mold;

means to transfer said heat softened sheets from said heating means to said shaping station;

means to shape said sheets between said upper and lower molds;

means to rotate said lower mold and said shaped sheet held thereagainst by vacuum from a first position wherein said shaping surface of said lower mold faces upward and is in

opposing relation to said shaping surface of said upper mold, to a second position wherein said shaping surface of said lower mold faces downward; and

means to remove said sheet from said shaping station.

18. A method of shaping heat softened sheet material comprising:

heating said sheet to its heat softening temperature;

depositing said heat softened sheet at a shaping station;

shaping said heat softened sheet between an upper mold and lower mold at said shaping station;

holding said shaped sheet against said lower mold;

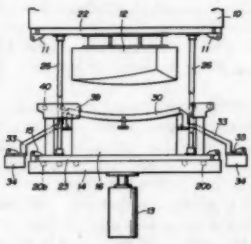
rotating said lower mold with said shaped sheet held thereagainst from a first position wherein said sheet is above said lower mold to a second position wherein said sheet is below said lower mold; and

removing said shaped sheet from said shaping station.

4,711,654
APPARATUS FOR SHAPING GLASS SHEET

Naohiro Iida, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jan. 30, 1987, Ser. No. 9,271
Claims priority, application Japan, Feb. 3, 1986, 61-21627
Int. Cl.[4] C03B *23/023*
U.S. Cl. 65—172 **6 Claims**



1. An apparatus for shaping a curved reinforced glass sheet by bending a glass sheet which has been heated by a heating furnace up to a softening point and thereafter cooling the bent glass sheet with a cooling medium and imparting a prescribed stress to the glass sheet, said apparatus comprising:

upper and lower mold members for bending the glass sheet;

a frame assembly having a top plate, a bottom plate, and a plurality of posts vertically connected between said top and bottom plates;

a first vertically displacing device mounted on said top plate;

an upper surface plate coupled to said first vertically displacing device and vertically movable thereby in said frame assembly;

a second vertically displacing device mounted on said bottom plate;

a lower surface plate coupled to said second vertically displacing device and vertically movable thereby in said frame assembly;

a first common plate fixed to said upper mold member and detachably secured to said upper surface plate by fixing means;

a second common plate fixed to said lower mold member and detachably secured to said lower surface plate by fixing means;

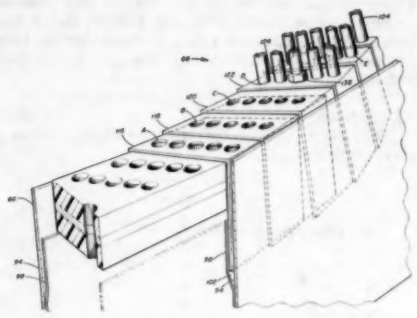
positioning means disposed between said first and second common plates for positioning said upper and lower mold members with respect to each other; and

a carrier for carrying a unit assembly comprising said upper and lower mold members and said first and second common plates upon replacement of the upper and lower mold members.

4,711,655
ADJUSTABLE QUENCH FOR TEMPERING A GLASS SHEET

Stephen J. Schultz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 9, 1986, Ser. No. 871,937
Int. Cl.[4] C03B *27/04*
U.S. Cl. 65—351 **26 Claims**



1. An apparatus for cooling a shaped glass sheet comprising:

a nozzle box;

a plurality of overlapping covers each having center portions overlying a flexible support and opposing leg portions extending along walls of said nozzle box such that said flexible support and covers are slidably engaged with said nozzle box to seal said box;

a plurality of nozzles extending from said flexible support, through openings in said center portions of said covers towards a major surface of said glass sheet wherein nozzle portions adjacent said major surface form a quench surface; and

means to adjustably bend said flexible support so as to modify the curvature of said quench surface formed by said nozzles.

4,711,656
ENHANCEMENT OF NITROGEN-FIXATION WITH RHIZOBIAL TAN VARIANTS

Tsuneo Kaneshiro, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 1, 1986, Ser. No. 891,939
Int. Cl.[4] C05F *11/08*
U.S. Cl. 71—7 **4 Claims**

1. A method of improving the capacity of a leguminous plant for fixation of atmospheric nitrogen in symbiosis with a Bradyrhizobium bacterium comprising inoculating the plant or the locus of the plant with a tan variant of the parental strain of said bacterium and culturing the plant in an environment conducive to symbiosis.

4,711,657

SUBSTITUTED TRIAZOLYLMETHYL TERT.-BUTYL KETONE COMPOUNDS AND PLANT PROTECTION AGENTS

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Klaus Lürssen, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

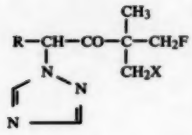
Continuation of Ser. No. 321,291, Nov. 13, 1981, abandoned, which is a continuation of Ser. No. 213,706, Dec. 5, 1980, abandoned. This application Dec. 21, 1984, Ser. No. 684,973

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951164

Int. Cl.[4] C07D *249/10*; A61K *43/653*

U.S. Cl. 71—92 19 Claims

1. A substituted triazolylmethyl tert.-butyl ketone compound of the formula



wherein

R is cyclohexylmethyl, 4-chlorobenzyl, 2,4-dichlorobenzyl or 3,4-dichlorobenzyl, and

X is hydrogen or fluorine;

and the hydrochloric acid addition salts thereof.

4,711,658

5-PERFLUOROACYLAMINO-4-NITRO-1-ARYL-PYRAZOLE SALTS, PLANT GROWTH REGULATING AND HERBICIDAL COMPOSITION CONTAINING THEM, AND PLANT GROWTH REGULATING AND HERBICIDAL METHOD OF USING THEM

Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, and Klaus Lürssen, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

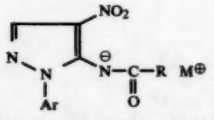
Filed Nov. 24, 1986, Ser. No. 934,047

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543034

Int. Cl.[4] A01N *43/56*; C07D *231/40, 401/04*

U.S. Cl. 71—92 11 Claims

1. A 5-perfluoroacylamino-4-nitro-1-arylpyrazole salt of the formula



in which

R represents a straight-chain or branched perfluoroalkyl radical with 1 to 8 carbon atoms,

M⊕ represents one equivalent of an alkali metal, alkaline earth metal or transition metal cation, or represents an ammonium ion which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of straight-chain or branched alkyl with 1 to 18 carbon atoms and benzyl and

Ar represents phenyl which is optionally mono- or polysubstituted by identical or different substituents, or represents 2o-pyridyl, 3-pyridyl or 4-pyridyl, in each case optionally mono- or polysubstituted by identical or different substituents, possible substituents in each case being selected from the group consisting of cyano, nitro, halogen, in each case straight-chain or branched alkyl, alkoxy and alkoxycarbonyl with in each case up to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl and halogenoalkoxy with in each case up to 4 carbon atoms and up to 9 identical or different halogen atoms and a radical —S-$(O)_m$—R^1, wherein

R^1 represents amino, or represents in each case straight-chain or branched alkyl, alkylamino, dialkylamino or halogenoalkyl with in each case up to 4 carbon atoms in the individual alkyl parts and, in the case of the halogenoalkyl, with up to 9 identical or different halogen atoms and

m represents the number 0, 1 or 2.

10. A method of killing or regulating the growth of plants which comprises applying to such plants or to a locus in which such plants are grown or to be grown an amount effective therefor of a salt according to claim 1.

4,711,659

ATTRITION RESISTANT CONTROLLED RELEASE FERTILIZERS

William P. Moore, P.O. Box 1270, Hopewell, Va. 23860

Filed Aug. 18, 1986, Ser. No. 897,160

Int. Cl.[4] A01N *37/38, 43/48, 43/64*; C05C *9/00*

U.S. Cl. 71—93 25 Claims

1. An attrition resistant, controlled release, fertilizer particle composition, comprising:

(a) a water soluble central mass of a plant food compound containing NH_2 functional groups amounting to at least 10 percent;

(b) a base coating, surrounding and chemically bonded to the central mass and consisting of substituted ureas, formed by reacting a molecular excess of a liquid polyfunctional isocyanate with the NH_2 functional groups of the central mass; and

(c) a water insoluble sealing layer, surrounding and chemically bonded to the base coating, formed by the reaction and polymerization of the excess polyfunctional isocyanate of the base coating with an amount of anhydrous organic polyol sufficient to produce a NCO to OH moiety ratio between 1 and 3.

4,711,660

SPHERICAL PRECIOUS METAL BASED POWDER PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1986, Ser. No. 905,013

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—0.5 B 28 Claims

1. A process comprising:

(a) mechanically reducing the size of a precious metal based material to produce a finer powder, the major portion of which has a particle size of less than about 20 micrometers;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet, to melt at least about 50% by weight of said finer powder to form essentially fine spherical particles of said melted portion;

(c) rapidly and directly solidifying the resulting high temperature treated material while in flight to form fine spherical particles having a particle size of less than about 20 micrometers in diameter, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends.

4,711,661

SPHERICAL COPPER BASED POWDER PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1986, Ser. No. 905,011
Int. Cl.[4] B22F 1/00
U.S. Cl. 75—0.5 B 22 Claims

1. A process comprising:

(a) mechanically reducing the size of a copper based material to produce a finer powder, the major portion of which has a particle size of less than about 20 micrometers;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet to melt at least about 50% by weight of said finer powder to form essentially spherical particles of said melted portion; and

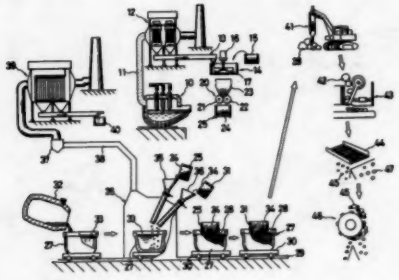
(c) rapidly and directly resolidifying the resulting high temperature treated material while in flight to form fine spherical particles having a particle size of less than about 20 micrometers in diameter, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends.

4,711,662

PROCESS FOR THE SIMULTANEOUS TREATMENT OF DUST, SLUDGE AND STEEL SLAG

Akihisa Harada, Kitakyushu, Japan, assignor to Nippon Jiryoku Senko Co., Ltd., Fukuoka, Japan

Filed Oct. 14, 1986, Ser. No. 918,192
Claims priority, application Japan, Jun. 11, 1986, 61-136721
Int. Cl.[4] C22B 1/00
U.S. Cl. 75—1 R 10 Claims



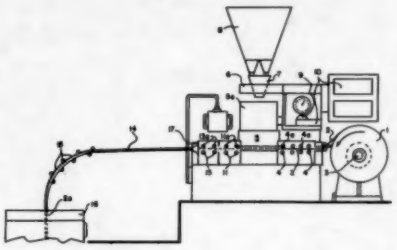
1. A process for the simultaneous treatment of dust, sludge and steel slag which comprises the first step of adding 5 to 20% by weight of a reducing agent to dust and sludge generated in the steel-manufacturing step, followed by kneading, the second step of converting the mixture kneaded in the first step into a lump having a particle size of 5 to 80 mm with a lumping device, the third step of adding the lump prepared in the second step and 5 to 20% by weight, based on the amount of the molten steel slag to be treated, of a silicate mineral containing water of crystallization to the molten steel slag to carry out the modification of the slag with bubbling due to the decomposition of the silicate mineral containing water of crystallization, and the fourth step of cooling the steel slag treated in the third step to recover a metal component by an ordinary mineral dressing method.

4,711,663

PROCESS FOR THE AUTOMATIC FORMING OF CONTINUOUS METAL TUBE FILLED WITH POWDERED MATERIALS, ITS DIRECT INTRODUCTION IN TO LIQUID METAL, AND RELATED EQUIPMENT

Lorenzo Ferrari, Lugano, Switzerland, assignor to Kinglor-Ltd, Lugano, Switzerland

Filed Dec. 10, 1986, Ser. No. 940,115
Int. Cl.[4] C21C 7/02
U.S. Cl. 75—53 9 Claims



1. A process for treating molten metal with additives, comprising the steps of:

unrolling a flat metallic sheet from a roll;

positioning said sheet adjacent a means for metering, weighing and feeding said additives onto said metallic sheet;

metering and weighing the amounts of said additives prior to feeding onto said metallic sheet;

controlling the discharge time sequence of said metering means onto said weighing means by a computer means capable of being programmed to select predetermined weights of said additives based on the type, quentity, and determined characteristics of said molten metal;

depositing said predetermined weighted additives onto said sheet;

advancing said sheet and then folding the side flanges thereof to form a generally U-shaped channel, then overlapping said side flanges such that said additives are compacted and said sheet forms, in situ, a continuous tubular member; and

immediately introducing said continuous tabular member into said molten metal.

4,711,664

PROCESS FOR PRODUCING ZIRCONIUM SPONGE WITH A VERY LOW IRON CONTENT

Young J. Kwon, Fruit Heights, and Susan M. Schulte, Ogden, both of Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

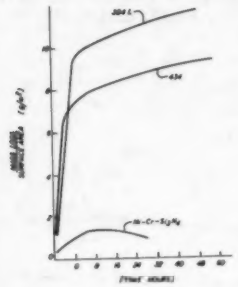
Filed Mar. 23, 1987, Ser. No. 30,007
Int. Cl.[4] C22B 34/10
U.S. Cl. 75—84.5 6 Claims

1. In a process for vacuum distilling zirconium sponge containing residual magnesium and magnesium chloride in a stainless steel lined vessel to remove said magnesium and magnesium chloride, the improvement of distilling same at a temperature below about 940° C. to prevent pickup of iron by the zirconium from the stainless steel lined vessel.

4,711,665
OXIDATION RESISTANT ALLOY

George Simkovich, State College, Pa., assignor to Pennsylvania Research Corporation, University Park, Pa.

Filed Jul. 26, 1985, Ser. No. 759,547
Int. Cl.[4] C22C *38/18*
U.S. Cl. 75—244 4 Claims

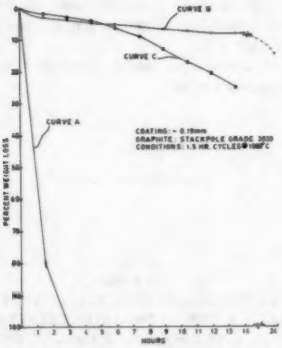


1. An oxidation resistant alloy consisting essentially of:
about 8 to 12 percent Cr by weight;
about 3 to 20 percent Si_3N_4 by volume;
about 1 to 2 percent Si by weight; up to about 0.2 percent by weight of a reactive element selected from the group consisting of Y, Sc, Th, La, and other rare Earth elements; and the balance selected from the group consisting of Fe, Ni, Co, a Fe-based alloy, a Ni-based alloy and a Co-based alloy.

4,711,666
OXIDATION PREVENTION COATING FOR GRAPHITE

Lloyd R. Chapman, Anderson County, and Cressie E. Holcombe, Jr., Knox County, both of Tenn., assignors to ZYP Coatings, Inc., Oak Ridge, Tenn.

Filed Feb. 2, 1987, Ser. No. 9,716
Int. Cl.[4] C09K *15/02, 15/32*
U.S. Cl. 106—14.12 15 Claims



1. A binder/suspension liquid for use in preparing a protective coating to substantially prevent oxidation of graphitic materials up to at least 1000 degrees Centegrade, which comprises:
a substantially pure colloidal silica solution of a selected volume;
a substantially pure mono-aluminum phosphate solution of a selected volume, said selected volume of said mono-aluminum phosphate solution being from about 0.54 to about 1.86 times said selected volume of said colloidal silica solution, said colloidal silica solution and said mono-aluminum phosphate solution being intimately mixed; and
substantially pure ethyl alcohol of a selected volume, said selected volume of said ethyl alcohol being from about 0.05 to 0.45 times the combined selected volumes of said colloidal silica solution and said mono-aluminum phosphate solution, said ethyl alcohol intimately mixed with said mixed colloidal silica solution and mono-aluminum phosphate solution.

4,711,667
CORROSION RESISTANT ALUMINUM COATING

John W. Bibber, Batavia, Ill., assignor to Sanchem, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 902,150, Aug. 29, 1986, abandoned. This application Sep. 18, 1986, Ser. No. 908,827
Int. Cl.[4] C23F *11/18*
U.S. Cl. 106—14.21 36 Claims

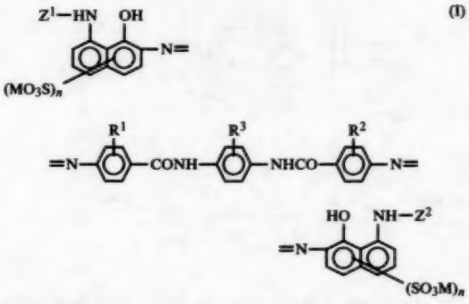
1. A basic pH aluminum coating composition to provide a a protective conversion coating for aluminum and aluminum alloys comprising as the essential ingredient thereof an alkali metal permanganate and a buffer compound selected from the group consisting of an alkali metal tetraborate, alkali metal metaborate, benzoic acid, alkali metal benzoate, alkali metal carbonate, and a mixture of the alkali metal tetra and metaborate.

4,711,668
AQUEOUS INK COMPOSITION

Masaru Shimada, Shizuoka; Toshiyuki Kawanishi, Numazu; Kakuji Murakami, Shizuoka; Tamotsu Aruga, Numazu; Hiroyuki Uemura, Numazu, and Kiyofumi Nagai, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,248
Claims priority, application Japan, Apr. 17, 1985, 60-080055
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 8 Claims

1. An aqueous ink composition comprising (i) a water-soluble dye having the formula (I) in an amount sufficient for ink printing and (ii) water,



(I)

wherein R^1 and R^2 each represent hydrogen, a lower alkyl group, a lower alkoxy group or halogen; R^3 represents hydrogen, a lower alkyl group, a lower alkoxy group, halogen, a sulfonic acid group or a sulfonate group; Z^1 and Z^2 each represent hydrogen, a lower alkyl group, a phenyl group, an acetyl group, an alkyl sulfonyl group, a benzoyl group which may have a substitutent selected from the group consisting of a lower alkyl group, a lower alkoxy group and halogen, a benzenesulfonyl group which may have a substituent selected from the group consisting of a lower alkyl group, a lower alkoxy group and halogen, or a 1,3,5-triazine group which may have a substituent selected from the group consisting of an alkyl group, an alkoxy group, a hydroxyl group, halogen, a hydroxyalkyl amino group, an alkyl amino group and an aro-

matic amino group; M represents hydrogen, an alkali metal or NH_4^+; and n is an integer of 1 or 2.

4,711,669

METHOD OF MANUFACTURING A BONDED PARTICULATE ARTICLE BY REACTING A HYDROLYZED AMYLACEOUS PRODUCT AND A HETEROCYCLIC COMPOUND

Albert P. Paul, Teaneck, N.J.; Richard A. Szarz, Medinah, Ill., and Roger J. Card, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 5, 1985, Ser. No. 795,068

Int. Cl.[4] B28B 7/28; C08L 1/00

U.S. Cl. 106—38.51 **25 Claims**

1. A method of manufacturing a bonded particulate article comprising the steps of

(i) admixing particulate material with a binder system, the binder system being formed by admixing a polyol comprising a hydrolyzed, gelatinized amylaceous material, a crosslinker for said polyol (ii) comprising the reaction product of glioxal, urea and formaldehyde, alone, or in further combination with ethylene glycol, a solvent, and an acid wherein said reaction is carried out at a pH of below about 7;

(ii) forming the admixture into a shape; and

(iii) curing to produce the bonded article.

4,711,670

MOISTENING AGENT FOR OFFSET PRINTING PLATES

Walter R. Müller, Dreieich, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,400

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505452

Int. Cl.[4] C08L 89/00, 89/06; B41N 1/00

U.S. Cl. 106—155 **4 Claims**

1. A moistening agent for an offset printing form comprising as active component 0.01 to 3 wt.-% of at least one organic polymer selected from the group consisting of non-crosslinked elastin or native, non-crosslinked collagen in aqueous medium having a pH of from 4.5 to 5.5 and 0.05 to 1.0 weight percent of longer-chain ($6 \leqq n \leqq 12$), nonpolymeric alcohols and/or alkanediols with hydroxyl groups in the 1,2 or 1,3 positions.

4,711,671

STORAGE STABLE PAPER SIZE COMPOSITION CONTAINING ETHOXYLATED LANOLIN

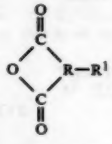
Emil D. Mazzarella, Mountainside; Walter Maliczyszyn, Somerville, and Jeffrey Atkinson, Neshanic Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation of Ser. No. 783,904, Oct. 3, 1985, abandoned. This application Apr. 27, 1987, Ser. No. 49,033

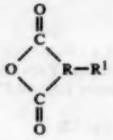
Int. Cl.[4] C08L 91/00

U.S. Cl. 106—243 **4 Claims**

1. A paper size comprising a self-emulsifiable mixture of 80 to 99 parts by weight of a cyclic dicarboxylic acid andydride having hydrophobic substitution and 1 to 20 parts by weight of an ethoxylated lanolin containing at least 15 moles ethylene oxide per mole lanolin wherein the cyclic dicarboxylic acid anhyride is represented by the formula:



wherein R represents a dimethylene or trimethylene radical and wherein R^1 is a hydrophobic group containing more than 4 carbon atoms which may be selected from the class consisting of alkyl, alkenyl, aralkyl, or aralkenyl groups.



4,711,672

ASPHALTIC COMPOSITION

Helen R. Gorter; Lyle E. Moran; Warren D. Robertson, all of Sarnia, and Shaunalea Savard, Guelph, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 21, 1986, Ser. No. 853,925

Int. Cl.[4] C08L 95/00

U.S. Cl. 106—281 R **17 Claims**

1. An improved asphaltic composition comprising asphalt, a mineral acid, a filler and a stabilizing agent selected from the group consisting of Group IA and/or Group IIB sulfates.

4,711,673

COMBINATION OF SURFACE MODIFIERS FOR POWDERED INORGANIC FILLERS

Lawrence L. Musselman, Apollo, and Thomas L. Levendusky, Greensburg, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 3, 1985, Ser. No. 783,863

Int. Cl.[4] C08K 9/04, 9/06, 9/00

U.S. Cl. 106—287.17 **9 Claims**

1. A filler composition containing a combination of surface modifiers, said composition comprising

(a) a powdered inorganic filler having a median particle size of less than about 15 microns, said filler being selected from the group consisting of alumina hydrate and bauxite, and

(b) surface modifiers for the filler comprising

(1) about 0.25 to 2.5 wt % of a mixture of saturated carboxylic acids consisting essentially of about 16 to 20 carbon atoms, said mixture having an iodine value of about 15 or less, and

(2) about 0.25 to 2.5 wt % of an organosilane comprising

(i) an organosilane of the formula

$$R_n(SiX_{4-n})_b$$

wherein R is selected from the group consisting of alkyl radicals containing 1 to 8 carbon atoms, alkenyl and alkynyl radicals containing 2 to 8 carbon atoms, and phenyl radicals, X is a hydrolyzable group; n=0 or 1; and b is at least 1 and not greater than 4, or

(ii) an organosilane of the formula

$$R_1R_2Si(OR_2)_2 \text{ or}$$

$$R_1Si(OR_2)_3$$

wherein R_1 is selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms, phenyl radicals, alkenyl radicals having 2 to 8 carbon atoms, and fluoroalkyl radicals having 3 to 8 carbon atoms, and R_2 is selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms, or

(iii) an organosilane of the formula

$$R_1R_2Si(OOCR_2)_2 \text{ or}$$

$R_1Si(OOCR_2)_3$

wherein R_1 and R_2 are defined above.

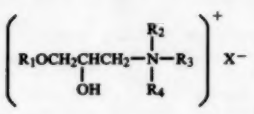
4,711,674

NON-BRONZING REDDISH LAKE PIGMENT

Hirohito Ando, Itako; Zenji Takada, Kamisu, and Yuko Shigeta, Choshi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Nov. 4, 1986, Ser. No. 926,530
Claims priority, application Japan, Nov. 8, 1985, 60-248918
Int. Cl.[4] C09C *3/00*
U.S. Cl. 106—289 11 Claims

1. A non-bronzing reddish lake pigment obtained by treating a reddish lake pigment with an N-(3-alkoxy-2-hydroxypropyl)-trialkylammonium salt represented by the general formula



(I)

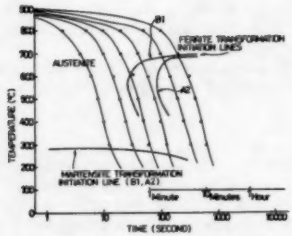
wherein each of R_1, R_2, R_3 and R_4 represents an alkyl group having 1 to 30 carbon atoms, and X represents a halogen atom, a sulfonic acid radical, an acetic acid radical or a formic acid radical.

4,711,675

PROCESS FOR IMPROVING THE SAG-RESISTANCE AND HARDENABILITY OF A SPRING STEEL

Toshiro Yamamoto, Tokai; Ryohei Kobayashi, Chita; Mamoru Kurimoto, Tokonabe, and Toshio Ozone, Nagoya, all of Japan, assignors to Aichi Steel Works, Ltd., Tokai and Chuo Hatsujo Kabushiki Kaisha, Nagoya, both of, Japan

Division of Ser. No. 405,802, Aug. 6, 1982, Pat. No. 4,544,406.
This application Jul. 18, 1985, Ser. No. 756,196
Claims priority, application Japan, Aug. 11, 1981, 56-126280
Int. Cl.[4] C21D *1/18*
U.S. Cl. 148—144 8 Claims



1. A process for improving the sag-resistance and hardenability of a spring steel, comprising the steps of:

preparing a steel alloy to include by weight 0.50–0.80% carbon, 1.50–2.50% silicon, 1.60–2.50% manganese and at least one member selected from the group consisting of 0.05–0.50% vanadium, 0.05–0.50% niobium and 0.05–0.50% molybdenum, the remainder being iron together with impurities;

rapidly heating the steel alloy at a heating rate of above 500° C./min to an austenitizing temperature from about 900° C. to 1200° C. for dissolving carbide of the member in the austenite structure; and

quenching and tempering the alloy at a tempering temperature between about 400° C. to 580° C. for precipitating dissolved carbide of the member as a fine carbide of the member in the martensite structure.

4,711,676

CARBURIZED PIN FOR CHAIN

Tadahiro Kitaori; Tsutomu Haginoya, both of Iruma, and Nobuto Kozakura, Hanno, all of Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan

Filed Jul. 28, 1986, Ser. No. 890,866
Int. Cl.[4] C22C *38/22*
U.S. Cl. 148—319 4 Claims

1. A surface hardened pin for a chain comprising

a core formed of a ferrous alloy containing manganese, silicon, chromium, molybdenum, about 0.1 to 0.4% carbon, and the balance essentially iron; and

a hardened surface layer formed on said core, said hardened surface layer containing chromium and 0.6 to 0.9% carbon and having a plurality of carbide particles dispersed therethrough.

4,711,677

HIGH TEMPERATURE BUSHING ALLOY

Ralph A. Mendelson, Anaheim, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 18, 1986, Ser. No. 888,188
Int. Cl.[4] C22C *38/48*
U.S. Cl. 148—325 14 Claims

1. A cast austentic stainless steel bushing having a good oxidation resistance and strength at operating temperatures up to 2000° F. and a coefficient of thermal expansion of at least 15×10^{-6} cm/cm/°C. and consisting essentially of about 29–32% chromium, 4–8% nickel, 1.3–1.7% carbon, 0.25–0.45% sulfur, 0.3–0.4% nitrogen, up to 1.0% manganese, up to 2.0% silicon, up to 1.0% molybdenum, up to 0.1% phosphorous, balance iron.

4,711,678

PROCESS FOR THE PREPARATION OF A WATER-IN-OIL EMULSION EXPLOSIVE AND A FUEL PHASE FOR USE IN SUCH PROCESS

Hans Ehrnström, Gyttorp, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Apr. 29, 1986, Ser. No. 857,138
Claims priority, application Sweden, May 8, 1985, 8502282
Int. Cl.[4] C06B *45/00*
U.S. Cl. 149—2 20 Claims

1. Fuel phase for use as a continuous phase together with a discontinuous aqueous oxidizing salt phase in water-in-oil emulsion explosives, comprising a carbonacous fuel and distributed therein a fuel phase component comprising at least one but not all components of a gassing system, the fuel and fuel phase component being adapted to product gas or bubbles throughout the emulsion when combined with an aqueous oxidizing phase containing remaining components of the gassing system.

4,711,679

HEXAKIS (2-NITROXETHYL) MELAMINE USEFUL AS AN ENERGETIC PLASTICIZER

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1985, Ser. No. 923,447
Int. Cl.[4] C06B *25/22*; C07D *251/54*
U.S. Cl. 149—96 2 Claims

1. Hexakis(2-nitroxyethyl)melamine.

2. A mixture of equal weights of nitrocellulose and hexakis(2-nitroxyethyl)melamine.

4,711,680
PURE FLUORINE GAS GENERATOR

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 23, 1983, Ser. No. 497,287
Int. Cl.[4] D03D *23/00*; C01B *7/20*
U.S. Cl. 149—109.4 **21 Claims**

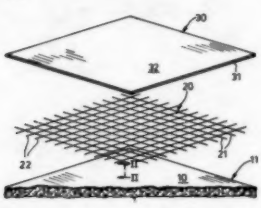
1. A solid grain pure fluorine gas generator, comprising:
- a stable salt containing an anion derived from a thermodynamically unstable high-oxidation state transition metal fluoride; and
- at least one Lewis acid which is stronger than said transition metal fluoride and stably solid at ambient temperatures, but which melts or sublimes at temperatures moderately above ambient.

21. A method of generating pure fluorine, comprising the steps of:
- mixing a stable salt containing an anion derived from a thermodynamically unstable high-oxidation state transition metal fluoride with a Lewis acid, wherein said Lewis acid is stronger than said transition metal fluoride and melts or sublimes at temperatures moderately above ambient;
- causing the temperature of said mixture to reach the melting or sublimation temperature of said Lewis acid;
- reacting said melting or subliming Lewis acid with said stable salt containing an anion derived from a thermodynamically unstable high-oxidation state transition metal fluoride to generate a thermodynamically unstable high-oxidation state transition metal fluoride which decomposes into a lower oxidation state fluoride and pure fluorine.

4,711,681
FASTENING OF A COVERING MATERIAL TO A SUBSTRATUM

Jürg Grossmann, Birrwaldstr. 19, CH-8135 Langnau a. A., and Marcel Grossmann, Maeschackerstr. 196, CH-8911 Rottenschwil, both of Switzerland

Filed Feb. 17, 1984, Ser. No. 581,312
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306627; Feb. 25, 1983, 3306630; Feb. 25, 1983, 8305304[U]
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—71 **7 Claims**

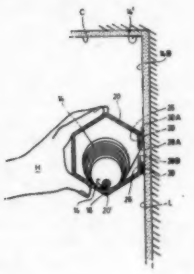


1. A method of fastening a floor covering material to the surface of a substratum by means of a discrete bonding layer which comprises: providing a bonding layer in a non-adhesive state, said bonding layer comprising chemically passive adhesive particles mixed with a plasticizer in an aqueous solution presenting, in the fused state, cohesive forces which are greater than adhesive forces thereof; applying said bonding layer to a supporting mesh of non-metallic, graphite free filaments by immersion of said mesh of filaments in said solution, drying said bonding layer at a temperature below 66° C. to remove water; placing said bonding layer-mesh as a composite between said floor covering material and said substratum surface as an interlayer between said covering material and said substratum; adjusting said floor covering material substantially to its desired position relatively to said substratum; activating said adhesive particles by heat; and subsequently cooling to produce a firm bond whereby the adhesive forces of said bonding layer exceed said cohesive forces.

4,711,682
WALLPAPER APPLICATOR DEVICES AND METHOD FOR ITS USE

Christian Barbe, 3593 Jacqueline, and Richard Barbe, 3591 Jacqueline, both of Laval, Quebec, Canada (H7P 5A6)

Filed Nov. 10, 1986, Ser. No. 929,000
Int. Cl.[4] E04F *13/00*; B44C *7/06*
U.S. Cl. 156—71 **6 Claims**



1. An applicator device for applying wallpaper on a flat surface, including an elongated casing defining a cross-sectionally polygonal structure, the casing consisting of at least two flat side walls and a third side wall having an intermediate longitudinal slot, end plates closing both ends of said casing, each end plate having a notch registering with said slot and a central through-bore through which a rolled web of said wallpaper is insertable into said casing with the leading edge portion of said wallpaper extending through said longitudinal slot, and further including a weight rod adapted to extend inside said casing between said end plates and through the cylindrical hollow defined by the rolled wallpaper web to bias the latter against a pair of adjacent flat side walls of said casing, the exterior face of said third side wall having resilient presser members longitudinally extending on either side of said slot spacedly thereof and adapted to press said wallpaper against said flat surface upon said applicator device being slidingly applied against said flat surface.

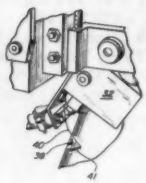
6. A method for applying wallpaper on a flat surface with an applicator device, including the following steps:
- (1) tightly rolling into a web a wallpaper having a preglued face;
- (2) engaging said web into an elongated casing through a bore at one end thereof, to constitute said applicator device;
- (3) pulling the leading edge portion of the wallpaper outwardly therefrom through a longitudinal slot formed along a wall of said casing;
- (4) immersing the said applicator device into a water basin and then releasing the tightly rolled web, whereby said web partially unrolls and thereby produces a counter-rotational circulation of water within said casing which moistens all of the said preglued surface of the wallpaper;
- (5) removing same from the basin;
- (6) inserting a weight rod within the rolled web;
- (7) applying said wallpaper leading portion against a surface; and
- (8) displacing said casing along said surface while pressing said casing thereagainst.

4,711,683

METHOD AND APPARATUS FOR MAKING ELASTIC DIAPERS

John R. Merkatoris, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Mar. 9, 1987, Ser. No. 23,136
Int. Cl.[4] B32B *31/08*
U.S. Cl. 156—164 14 Claims



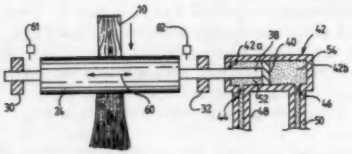
1. In a method applying a leg elastic ribbon to an elongated moisture-impervious web adapted to form a series of diapers, the steps of delivering a continuous stream of adhesive to a point adjacent to but spaced from said web, directing a first air stream adjacent said adhesive stream to entrain and draw said adhesive stream onto said web along a first longitudinal line, intermittently directing a second air stream adjacent said adhesive stream at an angle to said first air stream to shift said adhesive stream laterally to a second longitudinal line, and applying a stretched elastic ribbon to said web on said first longitudinal line.

4,711,684

METHOD AND APPARATUS FOR USE IN PRODUCING RECONSOLIDATED WOOD PRODUCTS

John D. Coleman, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU84/00241, § 371 Date Jul. 23, 1985, § 102(e) Date Jul. 23, 1985, PCT Pub. No. WO85/02367, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 23, 1984, Ser. No. 765,309
Claims priority, application Australia, Nov. 23, 1983, PG2514
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—196 23 Claims



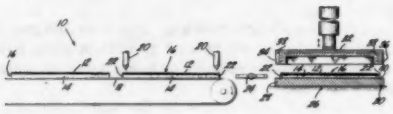
1. A process for forming a flexible open lattice work web of naturally interconnected wood strands which are generally aligned along a common grain direction with a substantial portion of said strands being substantially discrete but incompletely separated from each other comprising passing natural wood between a pair of rotating rollers the axes of which are disposed substantially parallel to each other so as to rollingly engage and rend the natural wood while simultaneously reciprocating at least one of said rollers relative to the other roller in a direction substantially parallel to the axes of said rollers to further spread the lattice work web without breaking said interconnected wood strands and damping the reciprocating movement of at least one of said rollers towards the end of each reciprocating movement to prevent damage to the web and the individual strands thereof.

4,711,685

SOFT TEXTURED REVEAL EDGE CEILING BOARD AND PROCESS FOR ITS MANUFACTURE

Theodore E. Hillman, Cloquet, Minn., assignor to USG Acoustical Products Company, Chicago, Ill.

Continuation of Ser. No. 395,586, Jul. 6, 1982, abandoned. This application Oct. 30, 1986, Ser. No. 924,124
Int. Cl.[4] B32B *5/02, 31/20, 31/22*
U.S. Cl. 156—220 14 Claims



1. A process for manufacturing a reveal edge fabric surfaced ceiling board having pressed and non-pressed portions comprising the steps of:

(a) bonding a fabric to one face of a preformed ceiling board, said ceiling board comprising wood fibers or mineral fibers and a re-activatable binder to form a laminate of said fabric and said preformed ceiling board; and

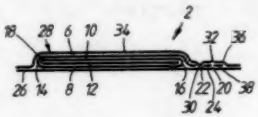
(b) simultaneously heating and pressing the periphery portion of the ceiling board while said reactivatable binder in said periphery portion is in a reactivatable condition to form a reveal edge ceiling board, said reveal edge being a portion of reduced height, higher density and greater strength as compared to a non-pressed portion of the ceiling board.

4,711,686

METHOD OF MAKING LABELS

David J. Instance, Guinea Hall, Sellindge, Kent, United Kingdom

Filed Feb. 18, 1986, Ser. No. 829,909
Claims priority, application United Kingdom, Feb. 18, 1985, 8504114
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—227 14 Claims



1. A method of producing a succession of self-adhesive labels carried on a backing of release material, comprising the steps of:

(a) applying a succession of folded labels to the adhesive surface of a first web of a pressure-sensitive self-adhesive material;

(b) applying, over the succession of applied folded labels and the adhesive surface, a second web comprising a self-adhesive support web having a backing of release material and being adhered to regions of the adhesive surface of the first web which are not covered by the applied folded labels;

(c) cutting through the layers of the webs other than the backing of release material so as to form a succession of self-adhesive labels on the backing of release material; and

(d) cutting, either before, after or simultaneously with step (c), a succession of elongate cuts or weakened tear lines through the first web so that in each resultant self-adhesive label the cut or weakened tear line extends around a portion of the edge of the applied folded label so that separation of the first web along the cut or weakened tear

line permits access to the interior of the applied folded label.

4,711,687

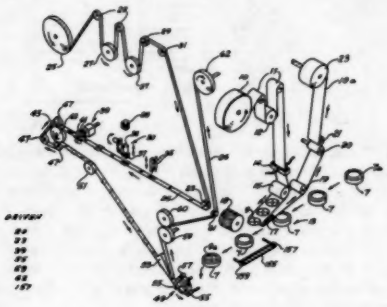
METHOD OF USING PRECISION CAN LABELER WITH OPTIONAL TAX STAMP APPLICATOR

Eugene H. Paules, Huntington, Conn., assignor to United States Tobacco Company, Greenwich, Conn.

Division of Ser. No. 820,940, Jan. 21, 1986, Pat. No. 4,657,622. This application Nov. 12, 1986, Ser. No. 930,343

Int. Cl.⁴ B44C *1/17, 1/00*

U.S. Cl. 156—235 **2 Claims**



1. A method for labeling a container such as a can and the like a top or bottom label and a side label, comprising the steps of:

(a) feeding a container into a top or bottom labeling station;

(b) advancing synchronously a chain conveyor with a container thereon and a label carrier strip;

(c) applying said top or bottom label on said container as said chain conveyor and said label carrier strip are being driven;

(d) interrupting the driving of said label carrier strip while said conveyor is being driven;

(e) admitting to a side positioning zone a container which has been top or bottom labeled while said conveyor is being driven;

(f) positioning on a side said container;

(g) feeding a side label into said positioning zone;

(h) rotating said container on a side; and

(i) joining said rotating container with said side label under stagewise increased pressure on said side label.

4,711,688

METHOD FOR ENCAPSULATING SEMICONDUCTOR COMPONENTS MOUNTED ON A CARRIER TAPE

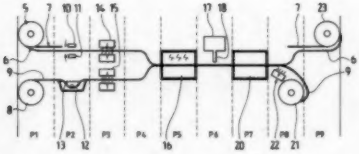
Seppo Pienimaa, Virkkala, Finland, assignor to Oy Lohja AB, Virkkala, Finland

Filed Mar. 6, 1985, Ser. No. 708,785

Claims priority, application Finland, Mar. 9, 1984, 840981

Int. Cl.⁴ B29C *39/18, 33/58*

U.S. Cl. 156—244.12 **6 Claims**



1. A method for encapsulating electronic components with an encapsulating polymer, wherein the components have conductors mounted on a carrier tape having an annular support area for each component, characterized by the steps of

pressing a mixture of a solvent and of a polymer of low surface energy onto the support area for each component from both sides of the carrier tape, wherein the mixture prevents spreading of the encapsulating polymer,

subjecting the carrier tape bearing the solvent and polymer mixture to a warm-air blast, during which the solvent evaporates such that polymer films of low surface energy remain on both sides of the support area,

guiding an encapsulating tape which has been moistened with a polymer of low surface energy and dried by means of warm-air treatment to the bottom of the components mounted on the carrier tape,

pressing the encapsulating tape evenly against the bottom of the components,

heating the combined assembly of carrier and encapsulating tapes in a first heating zone,

spreading encapsulating polymer onto the face of the component and onto an area between the support area and the component by means of a dispensing and spreading device,

heating the combined assembly of tapes including the encapsulating polymer in a second heating zone in order to harden the polymer encapsulation, and

detaching the encapsulating tape from the carrier tape, now containing the encapsulated components, so as to leave the bottom of the components unprotected.

4,711,689

PROCESS FOR RECONSOLIDATED WOOD PRODUCTION

John D. Coleman, Surrey Hills, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

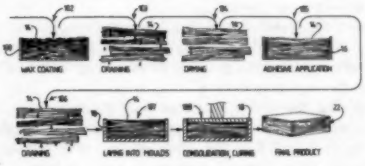
PCT No. PCT/AU84/00240, § 371 Date Jul. 23, 1985, § 102(e) Date Jul. 23, 1985, PCT Pub. No. WO85/02366, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 23, 1984, Ser. No. 765,307

Claims priority, application Australia, Nov. 23, 1983, PG2513

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—257 **12 Claims**



1. A process for forming a reconsolidated wood product from a plurality of flexible open lattice work webs each of naturally interconnected wood strands, each said web being formed by partially rending natural wood so that said strands thereof are generally aligned along a common grain direction, a substantial proportion of said strands of each web being substantially discrete but incompletely separated from each other, said process comprising superposing said webs, compressing the superposed webs to consolidate the strands whilst maintaining them such as to substantially extend in said original grain direction and bonding said strands and webs together to hold them in juxtapositions assumed pursuant to said consolidation, wherein said bonding process comprises coating the strands of the webs with wax, applying a bonding agent to the strands whose impregnation into the natural wood of the strands is restricted by the wax coating, removing excess bonding agent from the superposed webs and curing the bonding agent during said compression and consolidation of the strands of the superposed webs.

4,711,690

METHOD FOR MAKING AN IDENTIFICATION CARD HAVING FEATURES FOR TESTING IN INCIDENT AND TRANSMITTED LIGHT

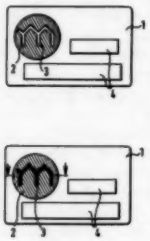
Yahya Haghiri-Tehrani, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 521,264, Aug. 8, 1983, abandoned. This application Dec. 18, 1985, Ser. No. 809,854

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231460

Int. Cl.[4] B32B *5/00, 27/00*

U.S. Cl. 156—309.6 13 Claims



1. A method of producing an identification card comprising the steps of

providing at least two layers of synthetic material, said layers differing with respect to transparency and softening temperature;

providing at least one surface of the layer having the higher softening temperature with a relief structure without throughgoing openings said structure corresponding to a pattern or characters and said relief structure being provided by either excavation or deformation of said layer up to a certain depth;

superposing said at least two layers such that the at least one surface of the layer being provided with said relief structure is adjacently situated to said layer having the lower softening temperature;

applying heat and pressure all over the surface of the superposed layers for laminating said layers, wherein the heat is applied such that the temperature within the superposed layers during the laminated process is higher than the softening temperature of the layer having the lower softening temperature but said temperature being lower than the softening temperature of the layer being provided with said relief structure such that the layer having the lower softening temperature equalizing said relief structure by at least partially filling impressions of the surface relief structure such that the laminated structure has a constant thickness with respect to its outer dimensions, said layers having different transparencies locally varying with respect to the thickness such that when subjected to transmitted light the areas of greater thickness within the layer of less transparency appear to be darker than the surrounding areas whereas when subjected to incident light said areas having a higher color-intensity than the surrounding areas and wherein said layers are provided within said identity card such that the relief structure is covered at one face thereof only by transparent layers such that said relief structure is visible from the outside of the card.

4,711,691

TIRE BUILD-UP MACHINE

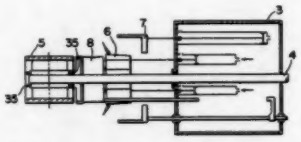
Hans Menell, Hanover; Hubert Ringhoff, Seelze, and Jürgen Rump, Garbsen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 798,173

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 3442302

Int. Cl.[4] B29D *30/24*

U.S. Cl. 156—415 4 Claims



1. A tire build-up machine having a core-loading machine and a build-up drum that is interchangeable quickly for build-up drums of different width to produce tires of different width and that is removably mounted on a drive shaft with the drum having a central rotational axis, with operating and control elements bearing against the end walls of said build-up drum which has a middle plane perpendicular to the rotational axis of the drum as an axial reference plane; the improvement in combination therewith comprising:

means including a respective spacer and abutment sleeve along with the core-loading mechanism as an auxiliary device positioned always with reproducible accuracy as corresponding to width of the respectively installed build-up drum associated therewith and as interposed between each of said end walls of said drum on the central rotational axis, and said operating and control elements being axially movable, for receiving the bearing pressures of the latter and being engageable as to the core-loading mechanism directly in a constantly uniform orientation that is always the same relative to the middle plane of the build-up drum as said axial reference plane and for exact positioning thereof during interchange as to different drum widths to convert production from narrow tire size to wide tire size without any great mounting and adjustment expenditure being necessary consequently to simplify and accelerate removal and exchange of build-up drums.

4,711,692

DEVICE FOR SMOOTHING SEALING COMPOUNDS IN INSULATING GLASS

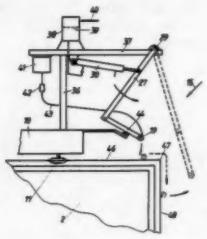
Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Jul. 5, 1985, Ser. No. 752,065

Claims priority, application Austria, Jul. 5, 1984, 2172/84

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—486 25 Claims



1. Device for smoothing the surfaces of filling material introduced into edge joints of insulating glass panes in corner

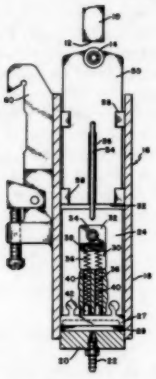
zones thereof, with at least one smoothing roll movable relatively to the insulating glass pane and freely rotatable about a first horizontal axis oriented transversely to the plane of the insulating glass pane, characterized in that the smoothing roll (17, 18, 19, 20) is arranged at the free end of a supporting arm (24, 44) which latter is freely pivotably connected for vertical swinging movement about a second horizontal axis to a lever arm (27) supported for vertical swinging movement about a third horizontal axis, all of said axes being parallel to each other, means (30) acting on the lever arm (27) to swing the lever arm to apply the smoothing roll to the glass pane, and weight means acting on said supporting arm (24, 44) to urge said smoothing roll (17, 18, 19, 20) toward the glass pane with a force no greater than the force generated by the action of gravity on said weight means.

4,711,693

ANVIL FOR ULTRASONIC SLITTING APPARATUS

Ernest P. Holze, Jr., Brewster, N.Y., assignor to Branson Ultrasonics Corp., Danbury, Conn.

Filed Jul. 7, 1986, Ser. No. 882,464
Int. Cl.[4] B29C *65/08*
U.S. Cl. 156—580.1 **5 Claims**



1. An anvil for an ultrasonic slitting device operative in conjunction with a horn dimensioned to be resonant at a predetermined ultrasonic frequency comprising:

a housing;

a piston slidably mounted in said housing for limited motion in said housing;

a mass, dimensioned to be resonant as a half wavelength resonator for ultrasonic energy traveling longitudinally therethrough at a frequency not lower than the resonant frequency of said horn, coupled to said piston for motion therewith;

a slitting implement fastened to one end of said mass in position for being urged into contact with said horn;

means coupled to said housing for causing responsive to fluid pressure said piston to be driven toward contact between said slitting implement and said horn, and

said mass coupled to said piston by a centrally disposed rod secured with one end to said piston and with the other end to said mass substantially at a nodal region of said mass.

4,711,694

PROCESS FOR PRODUCING A LAYER HAVING A HIGH MAGNETIC ANISOTROPY IN A FERRIMAGNETIC GARNET

Thierry Capra, Lyons, and Philippe Gerard, St. Ismier, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 28, 1985, Ser. No. 792,202
Claims priority, application France, Nov. 12, 1984, 84 17200
Int. Cl.[4] C30B *1/02, 19/00;* G11C *19/08;* B05D *3/06*
U.S. Cl. 156—603 **11 Claims**

1. A process for producing a ferrimagnetic garnet layer, which has a high magnetic anisotropy, on an amagnetic substrate, comprising the steps of:

forming at least one ferrimagnetic garnet layer by epitaxial growth on said amagnetic substrate;

implanting a high dose of ions derived from a gaseous element in said ferrimagnetic garnet layer which does not make the implanted portion of the ferrimagnetic layer amorphous, in order to produce defects within the garnet layer; and

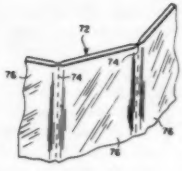
heating the entity in the presence of a reducing agent to a temperature ranging from 250° to 292° C.

4,711,695

APPARATUS FOR AND METHOD OF MAKING CRYSTALLINE BODIES

Richard W. Stormont, Warwick, R.I., and Lawrence Eriss, Sudbury, Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Division of Ser. No. 495,998, May 19, 1983, Pat. No. 4,647,437.
This application Aug. 7, 1986, Ser. No. 894,294
Int. Cl.[4] C30B *29/60, 15/34;* H01L *21/208*
U.S. Cl. 156—608 **2 Claims**



1. In method of producing a plurality of bodies of a substantially monocrystalline material from a hollow tube of said crystalline material, said method including the steps comprising growing said body from a pool of said melt provided by a die end of a die member, and cutting said tube into said plurality of bodies of said crystalline material, wherein the improvement comprises:

growing said tube from said die end of said die member so that said tube is thinner in cross section along predetermined lines than the remaining portions of said tube as said tube is being grown; and

cutting said tube along said predetermined lines so as to separate said hollow tube into said plurality of bodies of said crystalline material.

4,711,696

PROCESS FOR ENHANCING TI:AL_2O_3 TUNABLE LASER CRYSTAL FLUORESCENCE BY CONTROLLING CRYSTAL GROWTH ATMOSPHERE

Milan R. Kokta, Washougal, Wash., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 736,000, May 20, 1985, abandoned. This application Mar. 11, 1986, Ser. No. 838,605

Int. Cl.[4] C30B *15/10*

U.S. Cl. 156—617 SP 7 Claims

1. A method for making a Ti doped Al_2O_3 crystal suitable as a laser material comprising:

(i) making a solid phase mixture of a doping amount of TiO_2 in Al_2O_3 to provide a melt under a non-reactive atmosphere;

(ii) introducing carbon monoxide into said non-reactive atmosphere while the melt is in the solid phase;

(iii) purging said non-reactive atmosphere of carbon monoxide and its reactive gaseous products prior to liquifaction of said solid phase mixture;

(iv) introducing a reducing agent other than carbon monoxide into said non-reactive atmosphere as a substitute for said carbon monoxide; and

(v) heating said melt to a sufficiently high temperature under said non-reactive atmosphere to form a Ti:Al_2O_3 crystal.

4,711,697

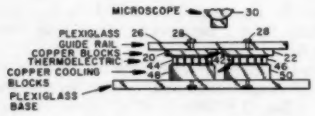
METHOD FOR INVESTIGATING THE FORMATION OF CRYSTALS IN A TRANSPARENT MATERIAL

William F. Kaukler, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 21, 1985, Ser. No. 800,194

Int. Cl.[4] B01J *17/08;* B01D *9/00*

U.S. Cl. 156—621 20 Claims



1. A method of investigating the formation of crystals in a transparent specimen material comprising the steps of:

melting the transparent specimen material in a fixed position heating zone;

forming a freezing isotherm to freeze the transparent specimen material in a gap positioned between a fixed position cooling zone which is separated from said heating zone by said gap by a predetermined distance capable of containing said freezing isotherm with suitable temperatures of said heating and cooling zones;

moving the transparent specimen material from said heating zone to said cooling zone;

varying the temperature of said heating zone and said cooling zone to create a variable temperature gradient across said gap and to maintain the freezing isotherm of said transparent specimen material in said gap in a substantially fixed position relative to said heating and cooling zones; and

observing the freezing isotherm of the transparent specimen material through an optically enlarging means to watch and analyze the formation of dendrites in said freezing isotherm of said transparent specimen material as the temperature of said heating and cooling zones are varied to produce said variable temperature gradient across said gap and therefore across said freezing isotherm.

4,711,698

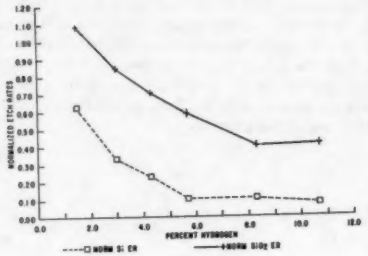
SILICON OXIDE THIN FILM ETCHING PROCESS

Monte A. Douglas, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 15, 1985, Ser. No. 755,140

Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06;* C23F *1/02*

U.S. Cl. 156—643 25 Claims



1. A method for selectively etching silicon oxides, comprising the steps of:

providing a substrate having thereon a thin film of silicon oxides which must be selectively etched with respect to another thin film layer on said substrate;

creating a glow discharge in proximity to said substrate; and

passing an etchant gas mixture through said glow discharge,

wherein the atomic percentage or carbon in said etchant gas mixture is less than 5% atomic;

and wherein the atomic ratio of fluorine to carbon in said etchant gas mixture is substantially greater than 2:1;

and wherein the percentage in said etchant gas mixture of all atomic species which form (in a glow discharge) molecules and radicals capable of adsorbing onto and reducing silicon oxides is in the range of 5% atomic to 50% atomic of said etchant gas mixture;

all of said atomic percentages being counted over all the component species of said etchant gas mixture which contain hydrogen, carbon, or fluorine, but disregarding inert gas components.

4,711,699

PROCESS OF FABRICATING SEMICONDUCTOR DEVICE

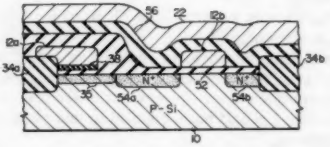
Haruo Amano, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 24, 1986, Ser. No. 855,756

Claims priority, application Japan, Apr. 25, 1985, 60-89316

Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 437—52 6 Claims



1. A process of fabricating a semiconductor device, comprising the steps of:

(a) preparing a silicon substrate having a surface portion,

(b) forming a first thermally grown silicon oxide film on said surface portion of the silicon substrate,

(c) forming a silicon nitride film on said silicon oxide film,

(d) forming a first polysilicon layer on said silicon nitride film,

(e) selectively etching away the polysilicon layer to leave a polysilicon conductor region, the polysilicon conductor region having a step portion over the silicon substrate,

(f) etching the silicon nitride and oxide films with said polysilicon conductor region used as a mask to expose said silicon substrate outside the polysilicon conductor region,

(g) forming a second thermally grown silicon oxide layer in part on said polysilicon conductor region and in part on an exposed surface portion of the silicon substrate, the second silicon oxide layer having a portion overlying the step portion of said polysilicon conductor region and an overhang portion located over said substrate in proximity to said step portion,

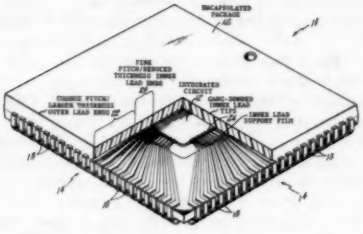
(h) forming a second layer of polysilicon having a portion overlying said step portion of said polysilicon conductor region and fully covering said overhang portion of said silicon oxide layer, and

(i) thermally oxidating the second layer of polysilicon for forming a polysilicon oxide layer having a portion resulting substantially from said portion overlying said step portion of the polysilicon conductor region, said portion of the polysilicon oxide layer being thicker than another portion of the polysilicon oxide layer and becoming thinner away from said step portion.

4,711,700
METHOD FOR DENSIFYING LEADFRAME CONDUCTOR SPACING

Michael D. Cusack, Monument, Colo., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 751,637, Jul. 3, 1985, abandoned. This application May 8, 1986, Ser. No. 861,208
Int. Cl.[4] C23F *1/02*; B44C *1/22*
U.S. Cl. 156—651 **3 Claims**



1. The method of fabricating a lead frame assembly, having bifurcated conductors with outer lead end regions of first thickness joined to a common tie-bar and inner lead end regions extending inwardly at a second thickness less than the first thickness to the assembly center portion, from a precut metal foil workpiece having first and second major surfaces spaced apart at a workpiece thickness, comprising the steps of:

applying a first step hardened photoresist pattern to the first and second major surfaces of the workpiece to expose on the first major surface a first area corresponding in size to the sum area of the center portion, the conductor inner end regions, and the gaps between inner end regions of adjacent conductors, and to expose on the second major surface a first area corresponding to the sum area only of the center portion and to said inner end region gaps;

first step etching both major surfaces simultaneously to remove approximately one-quarter of the workpiece thickness from each exposed area;

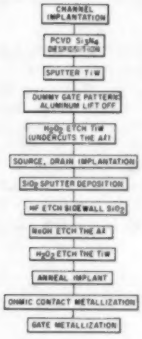
removing said first step photoresist pattern and applying a second step hardened photoresist pattern to again expose said first area of the first major surface and to expose a second area of the first major surface corresponding in size to the area of the gaps between outer end regions of adjacent conductors, and to expose on the second major surface a second area likewise corresponding in size to the area of said outer end region gaps, in register with said second area of the first major surface; and

second step etching both major surfaces simultaneously to remove one-half the workpiece material thickness from said exposed areas on each major surface, to provide the bifurcated conductor leadframe assembly.

4,711,701
SELF-ALIGNED TRANSISTOR METHOD

William V. McLevige, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1986, Ser. No. 908,071
Int. Cl.[4] H01L *21/306*; C23F *1/00*; B44C *1/22*; C03C *15/00*
U.S. Cl. 437—41 **10 Claims**



1. A method of self-aligned semiconductor device fabricaton, comprising the steps of:

(a) form a layer of a first dielectric on a semiconductor substrate;

(b) form a layer of a first metal on said layer of first dielectric;

(c) form patterned layer regions of a second metal on said first metal;

(d) etch said first metal with an etchant that does not substantially etch said second metal or said first dielectric; said etching continued until all of said first metal is removed except for that portion of said first metal which is both beneath said patterned layer regions and at least a predetermined distance from the closest edge of said patterned layer regions;

(e) implant dopants through said layer of first dielectric into said substrate to form doped regions in said substrate, said patterned layer regions and said first metal acting as an implant mask;

(f) deposit a second dielectric on the exposed portion of said layer of first dielectric;

(g) remove all of said first metal, thereby leaving an opening in said second dielectric which is aligned with said doped regions and is said predetermined distance from them;

(h) remove the exposed portion of said layer of first dielectric to extend said opening to said substrate;

(i) deposit a first contact in said opening and contacting said substrate; and

(j) form further contacts to portions of said substrate away from said first contact.

4,711,702
PROTECTIVE CONTAINERBOARD

Paul F. Hood, Stamford, Conn., assignor to Stone Container Corporation, Chicago, Ill.

Filed Sep. 25, 1985, Ser. No. 779,968
Int. Cl.[4] D21F *11/00*; D21H *3/78*
U.S. Cl. 162—123 **12 Claims**

1. A containerboard of improved strength for protecting electrostatic discharge sensitive devices against static electricity damage, electromagnetic damage and physical damage;

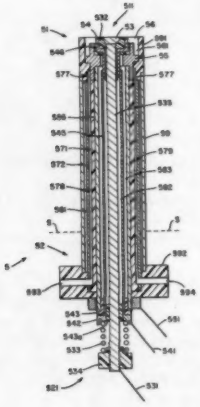
said containerboard being formed from an alkaline pulp, including a mixture of beaten cellulosic fibrous material, alkylketene dimer size and uncombined carbon powder and being characterized, when measured from a sample having a caliper of 10(±1) mils, by the following properties:

wherein said alkylketene dimer is present in an amount sufficient to fix said uncombined carbon powder within the range of from 0.3 to 3.5 percent by weight, a Mullen burst strength which exceeds 90(±1) pounds per square inch and a surface resistivity within the range of from 10^3 to 10^9 ohms per square.

4,711,703
THERMAL PROTECTION METHOD FOR ELECTROANALYTICAL CELL

Harry D. Wright, Collonge-Bellerive; John M. Hale, Meinier, and Eugen Weber, Hinwil, all of Switzerland, assignors to Orbisphere Corporation Wilmington, Succursale de Collonge-Bellerive, Collonge-Bellerive, Switzerland

Division of Ser. No. 691,519, Jan. 14, 1985, Pat. No. 4,585,542, which is a continuation of Ser. No. 345,536, Feb. 3, 1982, Pat. No. 4,518,477. This application Jan. 23, 1986, Ser. No. 821,747
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **7 Claims**



1. A method of thermally protecting an amperometric electroanalytical cell of the type comprising an electrolyte within an electrolyte space in contact with at least two electrodes and enclosed by a membrane that is substantially impermeable to said electrolyte but is permeable to an electroactive species, said membrane defining a sensor face for exposure to an ambient medium containing said electroactive species, said cell having an operative temperature range and being exposed temporarily to temperatures outside of said operative temperature range, said method comprising the steps of:

effecting a heat exchange within said cell for controlled heat compensation of said electrolyte when at least said sensor face of said cell is exposed to said temperatures outside of said operative temperature range;

said heat exchange step including passing a stream of heat transfer fluid through said cell;

said heat transfer fluid being passed through said cell to contact at least one heat conductive member therein that is in contact with said electrolyte space;

said heat conductive member being an electrode;

said electrode being the outermost electrode of a substantially coaxial electrode arrangement comprising a central electrode and at least one peripheral electrode around said central electrode;

said heat transfer fluid being passed through a substantially annular confined channel sealed from said electrolyte space but maintained in heat exchange contact therewith by said peripheral electrode; and

a conduit means being provided within said cell for passing said heat transfer fluid for an external source through said confined channel.

4,711,704
METHOD OF TINNING METAL STRIP

Jacques van Breda, Hillegom, and Cornelis Pronk, Castricum, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Feb. 17, 1987, Ser. No. 15,386
Claims priority, application Netherlands, Feb. 18, 1986, 8600404
Int. Cl.[4] C25D *7/06*
U.S. Cl. 204—28 **12 Claims**

1. A method of electrolytic tinning of a metal strip in a tinning line having a plurality of tinning tanks through which the strip moves in series while electrolysing current is passed, and having at at least one of the entry side and the exit side of the series of tinning tanks at least one buffer apparatus for storing a variable amount of the moving strip so that the strip speed in the tinning tanks can be temporarily different from the strip speed at the line entry or exit, the method being characterised in that the current passing in each tinning tank is adjusted during tinning for portions of the strip in accordance with its determination by the following steps:

(a) determination of a value for the thickness of the tin layer on the strip portion as it enter the tinning tank;

(b) determination of a value for the desired thickness of the tin layer on the strip portion as it leaves the tinning tank;

(c) from the difference of the values determined in steps (a) and (b), determination of a value g for the desired increase in the tin layer thickness on the strip portion in the tinning tank; and

(d) determination of the instantaneous required value of the current I in the tinning tank for the portion of the strip in dependence on the value g from step (c) and the instantaneous speed v of the strip through the tank.

4,711,705
ACTIVATION COMPOSITION AND METHOD FOR FORMING ADHERENT CHROMIUM ELECTRODEPOSITS ON FERROUS METAL SUBSTRATES FROM HIGH ENERGY EFFICIENT BATHS

Nicholas M. Martyak; John A. Corsentino, both of Hazlet, and Warren H. McMullen, E. Brunswick, all of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jan. 15, 1987, Ser. No. 4,374
Int. Cl.[4] C25D *5/36*; C25F *3/06*
U.S. Cl. 204—34 **16 Claims**

1. An activation composition for preparing a metal substrate to receive an adherent chromium electrodeposit thereon comprising a solution of iodate and fluoroborate ions.

4,711,706

METHOD OF PRODUCING GROOVE/LAND PATTERNS FOR DYNAMIC BEARINGS

Horst P. Wasel, Bornheim, and Horst W. Grollius, Cologne, both of Fed. Rep. of Germany, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jun. 3, 1986, Ser. No. 870,170
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521181
Int. Cl.[4] C25F *3/16*
U.S. Cl. 204—129.65 4 Claims

1. A method of journaling a rotatable member relative to another member, said members having juxtaposed surfaces, consisting essentially of:

laying out a pattern of dynamic-bearing lands and grooves on a metallic one of said surfaces;

masking lands of said pattern;

electropolishing said one of said surfaces after the masking of said lands of said pattern to form dynamic-bearing grooves of a depth sufficient to provide a dynamic fluid bearing layer between said surfaces and up to about 100 micrometers, thereby simultaneously forming dynamic-bearing lands between said grooves;

juxtaposing said surfaces for relative rotation; and

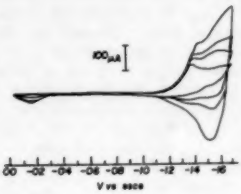
admitting a dynamic bearing fluid between said surfaces whereby the grooves and lands resulting from electropolishing form a dynamic bearing between said surfaces upon relative rotation of said members, said rotatable member being a bearing in an expansion turbine.

4,711,708

CHEMICALLY MODIFIED ELECTRODES FOR THE CATALYTIC REDUCTION OF CO_2

Thomas J. Meyer; Terrence R. O'Toole, both of Chapel Hill, N.C.; Lawrence D. Margerum, Los Angeles; T. David Westmoreland, San Mateo, both of Calif.; William J. Vining, Racine, Wis.; Royce W. Murray, and B. Patrick Sullivan, both of Chapel Hill, N.C., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 9, 1986, Ser. No. 917,383
Int. Cl.[4] B01D *57/02;* C25B *7/00*
U.S. Cl. 204—280 12 Claims



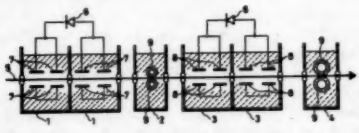
1. An electrode comprising a polymeric film adsorbed to said electrode, said film being formed by electropolymerization of (vbpy)Re(CO)$_3$Cl or [(vbpy)Re(CO)$_3$(MeCN)]$^+$, said film acting as an electrocatalyst for reducing CO_2 to CO within a solution.

4,711,707

METHOD FOR REMOVAL OF SCALE FROM HOT ROLLED STEEL

Kaoru Kikuchi, Ibaraki, and Nobuo Shikata, Tokyo, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jan. 16, 1987, Ser. No. 3,821
Claims priority, application Japan, Jan. 17, 1986, 61-8624
Int. Cl.[4] C25F *1/06*
U.S. Cl. 204—145 R 4 Claims



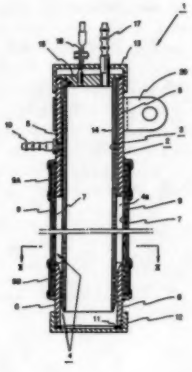
1. A method for the removal of scale from hot rolled steel, which comprises subjecting said steel covered with scale to anode electrolysis in an aqueous 5 to 20% sodium sulfate solution at a current density in the range of 0.2 to 1.2 A/cm^2 for a period of 30 to 60 seconds, and then subjecting said steel resulting from said anode electrolysis to anode electrolysis in an aqueous 5 to 20% sodium chloride solution at a current density in the range of 0.3 to 0.5 A/cm^2 for a period of 30 to 60 seconds.

4,711,709

DIAPHRAGM-ELECTRODE SYSTEM FOR ELECTROCOATING

Akito Inoue, 3-7-3, Sunagawa-cho, Tachikawa, Tokyo, Japan

Continuation-in-part of Ser. No. 499,818, Jun. 1, 1983. This application Oct. 4, 1985, Ser. No. 784,525
Claims priority, application Japan, Jun. 2, 1982, 57-82002
Int. Cl.[4] C25D *13/00*
U.S. Cl. 204—282 2 Claims



1. A diaphragm-electrode system for electrocoating paint onto a substrate and for removing neutralizers comprising an

electrode provided as a counterpart electrode corresponding to said substrate functioning as an electrode, and a diaphragm serving to separate the counterpart electrode from said substrate electrode as well as from paint components in an aqueous solution for electrodeposition characterized in that:

said diaphragm is wound around an outer surface of a tubular form diaphragm backing member made of an insulating material provided with a liquid permeable structure;

said counterpart electrode is hollow and in encased within said diaphragm backing member so as to define a narrow gap channel of less than 25 millimeters between said counterpart electrode and said diaphragm backing member;

a water running mechanism to forcibly flow water through said narrow gap channel wherein water is introduced under a positive pressure through an inlet at one end of said hollow counterpart electrode, flows inside of said hollow electrode to the other end of said electrode, flows into the said narrow gap channel and flows through said channel creating a turbulent flow to said one end at which point the water flows out of the diaphragm-electrode system through an outlet, said inlet and outlet for the water being provided on the same side of the diaphragm-electrode system and

said counterpart electrode disposed in said diaphragm backing member is installed in a manner to be easily inserted or deteched;

whereby paint neutralizers are removed from the aqueous solution and a diaphragm-electrode system for electrocoating paint onto a substrate in which the diaphragm and counterpart can be easily replaced is provided.

4,711,710

PROCESS FOR MAKING IMPROVED LUBRICATING OILS FROM HEAVY FEEDSTOCK

Nai Y. Chen, Titusville, N.J.; Thomas F. Degnan, Jr., Yardley, Pa.; Susan M. Leiby, Mantua, N.J.; Stephen M. Oleck, Moorestown, N.J., and Bruce P. Pelrine, Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 778,748, Sep. 23, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 938,214

Int. Cl.[4] C10G *11/05, 11/10, 45/64, 47/16*

U.S. Cl. 208—111 **24 Claims**

20. A process for dewaxing a hydrocarbon feedstock characterized by an initial boiling point of at least 700° F. and a 50 volume percent boiling point of at least 900° F. in which the hyrocarbon feedstock is contacted in a fixed bed in the presence of added hydrogen at a temperature of 450° F. to 800° F. with a particulate composite dewaxing catalyst comprising an aluminosilicate zeolite having a silica:alumina ratio of greater than 12:1 and a Constraint Index of 1 to 12 composited with an inorganic oxide binder, the particles of the catalyst composite having a maximum diffusion distance of less than 0.025 inch.

4,711,711

Patent Not Issued For This Number

4,711,712

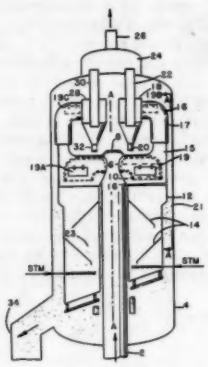
CLOSED CYCLONE FCC SYSTEM WITH PROVISIONS FOR SURGE CAPACITY

Klaus W. Schatz, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 812,429, Dec. 23, 1985, abandoned, which is a division of Ser. No. 529,451, Sep. 6, 1983, Pat. No. 4,581,205. This application Nov. 12, 1986, Ser. No. 930,044

Int. Cl.[4] C10G *11/18*

U.S. Cl. 208—153 **14 Claims**



1. A process for the fluid catalytic cracking of a hydrocarbon feed whereby the hydrocarbon feed is catalytically cracked by passing a suspension of hydrocarbon feed and catalyst through a riser conversion zone under cracking conditions into a disengaging vessel, the catalyst recovered from said riser conversion zone is thereafter regenerated to remove carbonaceous deposits before return of the regenerated catalyst to said riser conversion zone, and the hydrocarbon feed catalyst suspension is separated upon discharge from the riser conversion zone, comprising the following steps:

(a) discharging the suspension outwardly through an opening in the upper periphery of the riser and through a radially extending restricted passageway having an opening at the bottom side of the outer extremity thereof whereby a substantially confined catalyst stream discharges in a downward direction generally separate from the cracked hydrocarbon feed vapors, said restricted passageway begin curved downwardly adjacent the outer end thereof to induce a downward movement of said confined catalyst stream in said passageway sufficient to direct said stream downwardly into the open upper end of a catalyst stripping passageway positioned beneath said outer end to maintain catalyst, so collected and directed, separate from said discharged cracked hydrocarbon feed vapors, and said radially extending restricted passageway being surrounded and contained by a vertically disposed elongated restricted passageway in spaced relationship thereto, and the elongated restricted passageway being in fluid communication, at its upper end, with the inlet of a first cyclone separation means, and, at its lower end, with the catalyst stripping passageway and said vertically disposed passageway being attached to the catalyst stripping passageway to form a closed conduit,

(b) passing the cracked hydrocarbon feed vapors through the disengaging vessel to the upper portion thereof and

into the entrance of the first cyclone separation means by discharging the cracked hydrocarbon feed vapors from the outer extremity of the radially extending restricted passage to said vertically disposed elongated restricted passageway and passing the cracked hydrocarbon feed vapors from the vertically disposed elongated passageway into the first cyclone separation means without passing into the atmosphere of said vessel during steady state catalyst flow, said elongated restricted passageway comprising a surge capacity means, upstream of said first cyclone, for accommodating a sudden increased rate of flow of said catalyst stream within said elongated restricted passageway, said surge capacity means being closed during steady state rate of flow of said catalyst within said elongated restricted passageway, thereby preventing catalyst flow therethrough but allowing stripping gas flow therethrough.

4,711,713

PROCESS FOR ENHANCING THE CETANE NUMBER AND COLOR OF DIESEL FUEL

Hossein Zarrineghbal, and Charles W. Quinlan, both of Amherst, Mass., assignors to REI Technologies, Inc., Concord, Mass.

Continuation-in-part of Ser. No. 832,196, Feb. 24, 1986, Pat. No. 4,463,820. This application Feb. 9, 1987, Ser. No. 12,466

Int. Cl.[4] C10G *17/00, 19/02, 29/02*

U.S. Cl. 208—222 **58 Claims**

1. A process for enhancement of the cetane number of a diesel fuel comprising:

(1) treating a diesel oil with a nitrogenous treating agent in a nitrogen amount, equivalent on a 100% nitric acid basis, of about 10 weight percent or less of the diesel oil feed;

(2) separating unreacted nitrogenous treating agent from the diesel oil of step (1);

(3) treating the diesel oil of step (2) with an inorganic alkali to produce a treated diesel oil; and

(4) blending the treated diesel oil of step (3) with an untreated diesel oil which has not been treated as in step (1) above to produce a blended diesel fuel such that the added nitrogen content in the blended diesel fuel is

(a) about 300 ppm or less nitrogen added when the diesel oil treated in step (1) is obtained from virgin diesel oil stock; or

(b) about 450 ppm or less nitrogen added when the diesel oil treated in step (1) is obtained from hydrotreated diesel oil stock.

4,711,714

METHOD FOR THE SEPARATION OF GAS FROM OIL

Ian C. Callaghan, Wokingham; Clive M. Gould, Colnbrook, both of England, and Wojciech Grabowski, Versoix, Switzerland, assignors to The British Petroleum Company p.l.c., London, England

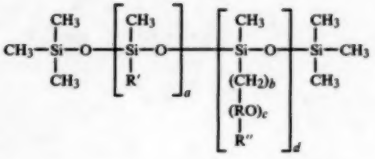
Filed Jun. 21, 1985, Ser. No. 747,275

Claims priority, application United Kingdom, Jun. 30, 1984, 8416697

Int. Cl.[4] B01D *19/04*

U.S. Cl. 208—348 **8 Claims**

1. A method for separating crude oil containing associated gas into liquid oil and free gas in the presence of an anti-foam agent characterised by the fact that the anti-foam agent is a water-insoluble polysiloxane polyoxyalkylene graft copolymer



wherein

R is an ethylene, propylene or butene group or a mixture thereof;

R′ is a hydrocarbyl group containing 1 to 8 carbon atoms;

R″ is a hydroxyl group, an alkoxy group or an alkyl group containing 1 to 8 carbon atoms;

(a) is a number in the range of 100 to 250;

(b) is a number in the range of 1 to 6;

(c) is a number in the range of 1 to 10; and

(d) is a number in the range 10 to 100.

4,711,715

APPARATUS FOR EXTRACORPOREAL TREATMENT OF BLOOD

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 599,883, Apr. 13, 1984, abandoned. This application Jan. 29, 1986, Ser. No. 823,887

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313421

Int. Cl.[4] A61M *1/34*

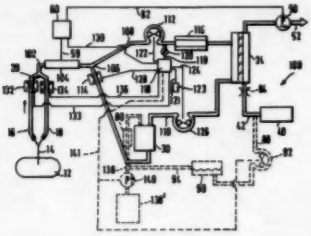
U.S. Cl. 210—103 **13 Claims**

1. In a hemodialysis apparatus comprising a first chamber, a second chamber, a dialysis solution circuit, a blood circuit, means for preparing a fresh dialysis solution, and means for withdrawing ultrafiltrate from said dialysis circuit, said first chamber being separated by means of a membrane from said second chamber, said first chamber being connected into said dialysis solution circuit, and said second chamber being connected into said blood circuit, said blood circuit including a first blood side upstream of said second chamber and a second

blood side downstream of said second chamber, the improvement comprising:

a single sensor coupled between a single connection with a patient and a branch of said blood circuit into said first and second blood sides, said sensor alternately sensing inflowing blood quantities and outflowing blood quantities;

an ultrafiltrate controller coupled to said sensor for receiving signals from said sensor and being operative during a first time interval to recognize a first output signal from said sensor representing outflowing blood quantities and being operative during a second time interval to recognize a second output signal from said sensor representing inflowing blood quantities and being operative after said first and second time intervals to compare said first output signal with said second output signal to determine the actual ultrafiltration rate;



a control unit connected to said ultrafiltrate controller, said control unit having input means for inputting a predetermined ultrafiltration rate; and

a dialysis solution pump coupled in said dialysis circuit downstream of said first chamber and operatively coupled to said ultrafiltrate controller for changing the pressure in said dialysis solution circuit, thereby changing the transmembrane pressure to cause the actual ultrafiltration rate to approach said predetermined ultrafiltration rate.

4,711,716

DECANTING APPARATUS

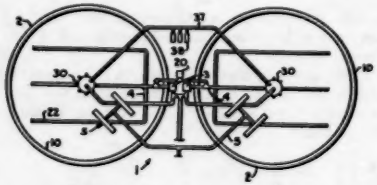
Glen R. Callthorp, 16006 Beckett La., Olathe, Kans. 66062; Kenneth L. Norcross, III, 1240 W. 70th Terr., Kansas City, Mo. 64113, and Dennis L. Nelson, 147 S. Normandy Dr., Olathe, Kans. 66061

Continuation-in-part of Ser. No. 778,323, Sep. 20, 1985, Pat. No. 4,648,967. This application Jan. 29, 1987, Ser. No. 939,008

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.[4] B01D *45/02*

U.S. Cl. 210—136 **8 Claims**



1. A decanting apparatus for removing an upper fluid layer from a wastewater treatment reservoir; said apparatus comprising:

(a) a fluid receiver having an interior chamber;

(b) support structure means for mounting said receiver in the reservoir; said support structure means cooperating with said receiver for maintaining said receiver at a generally constant depth relative to an upper fluid level within the reservoir during decanting;

(c) an aperture in said receiver for communicating between said receiver interior chamber and fluid in the reservoir; said aperture being located on a lower side of said receiver;

(d) means designed for preventing sludge from entering said interior chamber when not decanting including:

(1) flap means selectively covering said receiver aperture and being connected on one side of said aperture to said receiver and being swingable away from said receiver on an opposite side of said aperture; and

(2) biasing means cooperating with said flap means to selectively cover said aperture with said flap when not decanting such that said flap means operatively prevents entry of fluid into said receiver through said aperture when decanting is not occurring and such that said flap means allows flow of fluid into said chamber through said aperture when decanting is occurring, and said flap preventing substantial quantities of sludge from accumulating in said receiver when fluid in said reservoir containing sludge is being agitated between decanting periods.

4,711,717

FILTER CARTRIDGE FOR FLUIDS

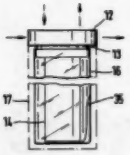
Joachim Wolf, Malmsheimer Strasse 67, 7252 Weil der Stadt, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,426

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520139

Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—137 **19 Claims**



1. A filter device for fluid media, comprising:

a filter cartriddge with an inflow surface and a flow-off surface;

a filter bowl having a side wall with a free end region and a bottom region;

a disk-shaped adaptor located at one end of said filter cartridge, having an adapter face adjacent to said free end region of said side wall of said filter bowl, means defining at lest one first orifice for inflowing unfiltered medium, and means defining at least one second orifice for flowing-off filtered medium;

a sealing device between said adaptor and said free end region of said side wall of said filter bowl; and

a media-proof hose having a first end region connected in a sealed manner to said adaptor face and a second end region that is closed at least during the operation of the filter device;

said hose being arranged and adapted to receive said filter cartridge at least over part of its length;

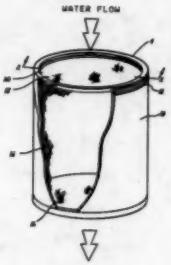
said hose being comprised of material of adequate strength to be detached from said bowl and said filter cartridge without tearing, with filtrate and media contained in said hose.

4,711,718

ION-SELECTIVE WATER FILTER

Sidney G. Nelson, Jr., Hudson, Ohio, assignor to Sanitech, Inc., Twinsburg, Ohio

Filed Jan. 20, 1987, Ser. No. 5,215
Int. Cl.[4] B01D *27/02*
U.S. Cl. 210—282 2 Claims



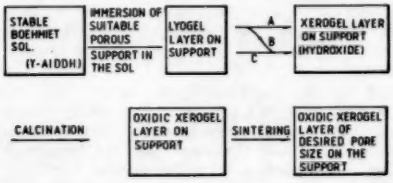
1. A device for removing dissolved lead and copper ions from drinking water consisting of a vessel that attaches to the outlet section of a water dispensing faucet; a bed containing catechol siderophore modified by substituting bromine, chloride or nitrogen oxide in the benzene ring of the catechol that selectively removes and absorbs lead and copper ions from waters passing through it; and porous support means for holding said bed in place in said vessel and for allowing water to flow through the bed.

4,711,719

PROCESS FOR THE PRODUCTION OF CRACK-FREE SEMI-PERMEABLE INORGANIC MEMBRANES

Adriaan F. M. Leenaars; Anthonie J. Burggraaf, and Klaas Keizer, all of P.O. Box 217, 7500 AE Enschede, Netherlands

Filed Sep. 5, 1984, Ser. No. 647,545
Claims priority, application Netherlands, Sep. 5, 1983, 8303079
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.26 7 Claims



1. A process for the production of dry, crack-free mechanically and chemically stable, semi-permeable inorganic membranes by coating a microporous support of sintered α-Al_2O_3 by contacting the support with a sol containing particles of Al_2O_3 and drying and heating the coated support, characterized in that

(a) the support has a thickness from 50μ to 5 mm;

(b) the sol comprises as Al_2O_3 particles Boehemite particles with a size of from 3 nm to 2μ, dispersed in water in a concentration from 0.01 to 25% by weight, the water also containing HNO_3 or $HClO_4$ in a concentration of 0.01 to 0.20 mol per mol Boehemite;

(c) said support is immersed in a dry state in said sol for from 1 to 5 seconds; and

(d) said contacted support after being dried in air is heated to a temperature of at least 390° C. and at most 1500° C., wherein said membrane is less than 20μ in thickness.

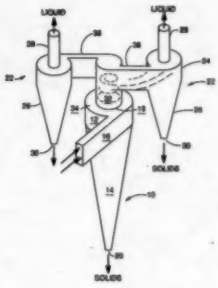
7. An inorganic membrane produced by the process of claim 1.

4,711,720

TANGENTIALLY STAGED HYDROCYCLONES

Grant A. Young, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Jul. 18, 1986, Ser. No. 888,171
Int. Cl.[4] B01D *17/038*
U.S. Cl. 210—512.2 9 Claims



1. A hydrocyclone separation system for separating a fluid mixture into at least two separate density components, and for precluding remixing of semiseparated higher density components, comprising:

a primary separation chamber having an upper portion and a conical lower portion, the upper portion including a tangential fluid inlet and a fluid outlet, and the conical lower portion including a fluid outlet;

at least one secondary separation chamber having an upper portion and a conical lower portion, the upper portion including a tangential fluid inlet and a fluid outlet, and the conical lower portion including a fluid outlet; and

means for precluding remixing of semiseparated higher density components, comprising a flow direction conduit extending tangentially from the fluid outlet in the upper portion of the primary separation chamber to the tangential fluid inlet of the at least one secondary separation chamber.

4,711,721

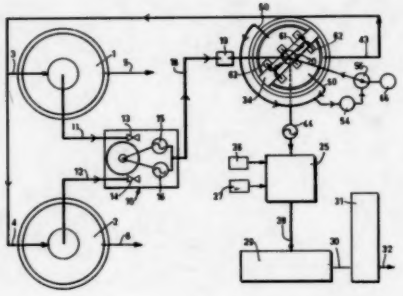
WASTE WATER SLUDGE THICKENER WITH ODOR CONTROL

Bernard Jamonet, Bourg de Peage; Alain Rigouard, Echirolles; Jean-Pierre Bouchez, Les Eymes, and Jean Duc, Versailles, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Division of Ser. No. 577,742, Feb. 7, 1984, abandoned, which is a continuation of Ser. No. 381,622, May 24, 1982, abandoned.
This application Jun. 25, 1985, Ser. No. 748,697
Claims priority, application France, May 25, 1981, 81 10315
Int. Cl.[4] C02F *1/72*
U.S. Cl. 210—607 1 Claim

1. A process for thickening waste water sludge issued from a clarifier for waste water, comprising the steps of: introducing fresh waste water sludge, issued from a clarifier, into a central upper part of a thickening tank of circular shape having a lower part having a bottom in the form of an upwardly opening cone and having scraper means rotatable at low speed in said lower part of the tank and having arms extending upwardly from said lower part of the tank, thereby to form a lower thickened sludge layer and an upper supernatant layer upon rotation of said scraper means, while at the same time imparting only a minimum of agitation to the sludge layer and

to the supernatant layer above it; removing thickened sludge through a central aperture in said bottom of the tank; withdrawing supernatant from said supernatant layer at at least one first upper peripheral portion of said tank and recycling it to an input of said clarifier, and further withdrawing supernatant from said supernatant layer at opposite second upper peripheral portions of the tank substantially at the surface of said supernatant layer and oxygenating this further withdrawn supernatant in an oxygenation device, and reintroducing said oxygenated, further withdrawn supernatant into said supernatant layer in said tank by means of a plurality of diffusers



mounted on and distributed along a support extending transversely across said circular tank and disposed above said supernatant layer, said diffusers extending downwardly from said support into said supernatant layer and said support being disposed intermediate said opposite second upper peripheral portions of said tank and extending perpendicular to a line interconnecting said opposite second upper peripheral portions, in order both to minimize agitation of said supernatant layer in said tank and to avoid any direct mixing of said further withdrawn supernatant with the supernatant layer in the tank in the vicinity of said first and second peripheral portions.

4,711,722

METHOD FOR PREVENTING FOULING OF ELECTRODIALYSIS MEMBRANE

Seiji Toyoshi, Saga; Tomoya Yoshizumi, Kawasaki; Masaru Saeki, Fujisawa, and Tetsuya Kawakita, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 561,570, Dec. 15, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 821,882

Claims priority, application Japan, Oct. 12, 1983, 58-190193

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—638 **3 Claims**

1. In a method of preventing fouling of an electrodialysis membrane during desalting by membrane electrodialysis of a fermentation liquor comprising an inorganic salt and an amphoteric electrodialysis membrane fouling substance, wherein the fermentation liquor is obtained from molasses selected from the group consisting of cane molasses and beet molasses, and contains material of isoelectric point within the range of pH 3–4 as the amphoteric electrodialysis membrane fouling substance, the improvement consisting of:

(a) adjusting the pH of the solution to about the isoelectric point of the fouling substance prior to desalting to produce a pH adjusted fermentation liquor and thereafter,

(b) subjecting the pH adjusted fermentation liquor retaining the electrodialysis membrane-fouling substances in a noncharged state to the electrodialysis desalting procedure, and

(c) recovering a desalted fermentation liquor.

4,711,723

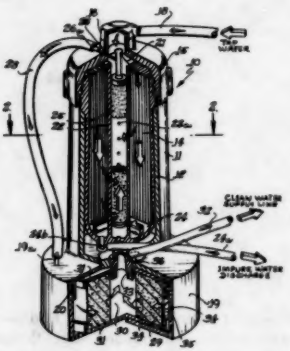
WATER PURIFICATION SYSTEM

Donald T. Bray, Escondido, Calif., assignor to Nimbus Water Systems, Inc., Escondido, Calif.

Filed May 27, 1986, Ser. No. 867,480

Int. Cl.[4] C02F *9/00*

U.S. Cl. 210—652 **6 Claims**



1. A self-contained water purification device having an integral, free-standing housing, including a base for supporting the device, comprising, in combination, a pressure vessel supported in the housing and including first tubing means for receiving supply water at a pressure beteen approximately 20 and 100 psig, a reverse-osmosis filter element having a semipermeable membrane with a surface area of at least 2 sq. cm per cu. cm of volume of the reverse-osmosis filter element supported within the pressure vessel, means for discharging from the pressure vessel a portion of the supply water and impurities unable to pass through the reverse-osmosis filter element, second tubing means for receiving product water that has passed through the reverse-osmosis filter element, second tubing means exiting from the pressure vessel and terminating at an inlet to a carbon unit located within the base containing between approximately 10 and 1,000 grams of activated carbon, within which the product water has a residence time of between approximately 5 and 30 minutes, a flow passage within the base causing the product water to flow through the activated carbon, and third tubing means receiving the product water after it has flowed through the activated carbon, the third tubing means terminating in a region exterior of the housing.

5. A continuous method of purifying tap water comprising passing tap water at a pressure of between approximately 20 and 100 psig through a reverse-osmosis filter membrane, flowing the filtered water at a rate of between approximately 5 and 100 milliliters per minute through between approximately 10 and 1,000 grams of activated carbon, maintaining the filtered water in contact with the activated carbon between approximately 15 and 30 minutes, and flowing the water out of the activated carbon for use.

4,711,724

METHOD FOR PREVENTION OF PHOSPHONATE DECOMPOSITION BY CHLORINE

Donald A. Johnson, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 776,551, Sep. 16, 1985, Pat. No. 4,642,194. This application Oct. 23, 1986, Ser. No. 922,215

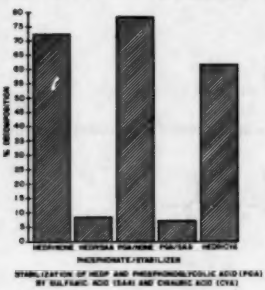
The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.[4] C02F *5/14*

U.S. Cl. 210—699 **2 Claims**

1. A method of preventing the decomposition of phosphonates from the group consisting of 1,1-hydroxyethylidene

diphosphonic acid, tris aminomethane phosphonic acid, 1-phosphono glycolic acid, ethylene diamine tetra (methylene phosphonic acid), hexamethylene diamine tetra (methylene phosphonic acid), and diethylene triamine penta (methylene-



phosphonic acid) which are present in an effective amount to prevent scale in industrial cooling waters which contain an effective amount of chlorine for microbiological control which comprises treating such waters with at least ¼ ppm of cyanunic acid.

4,711,725

METHOD OF STABILIZING AQUEOUS SYSTEMS

David R. Amick, Chalfont; William M. Hann, Pennsburg, and John Natoli, Ambler, all of Pa., assignors to Rohm and Haas Co., Philadelphia, Pa.

Continuation-in-part of Ser. No. 749,059, Jun. 26, 1985, abandoned. This application May 7, 1986, Ser. No. 861,732

Int. Cl.[4] C02F *5/12*

U.S. Cl. 210—701 9 Claims

1. A method for stablilizing an aqueous system by inhibiting the precipitation of calcium phosphate with and without the presence of iron contamination in such an aqueous system comprising adding to said aqueous system an effective amount of a water soluble polymer comprising from about 42 to about 84 weight percent (meth)acrylic acid and salts thereof, greater than about 11 to less than about 40 weight percent 2-acrylamido -2methyl propane sulfonic acid or salts thereof, and from at least about 5 to about 30 weight percent of one or more units selected from the group consisting of vinyl esters, vinyl acetate and substituted acrylamide, and where said water soluble polymer a weight average molecular weight ranging from about 3000 to about 25,000.

4,711,726

CARBOXYLATE N-VINYLAMIDE COPOLYMERS FOR INTERNAL SCALE CONTROL AND PASSIVATION IN HIGH PRESSURE BOILER SYSTEMS

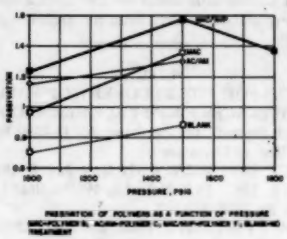
Claudia C. Pierce; Robert S. Robinson, both of Naperville, and James F. Kneller, LaGrange Park, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Dec. 29, 1986, Ser. No. 947,060

Int. Cl.[4] C02F *5/12*

U.S. Cl. 210—701 2 Claims

1. A method of treating boiler waters having a pH of at least 8.5 which are in contact with heat transfer surfaces to prevent formation of scale on, to remove previously formed scale from, and to form a corrosion resistant surface on these heat transfer surfaces which comprises treating the boiler waters which are found in boilers operating at a pressure of at least 800 psi with at least 3 ppm of a water-soluble copolymer which contains from 60–95 mole percent of methacrylic acid, and 5–40 mole



percent of N-vinylpryrrolidone, said copolymer having a molecular weight within the range of 10,000–50,000.

4,711,727

COMPOSITIONS COMPRISING MINERAL PARTICLES IN SUSPENSION AND METHOD OF TREATING AQUEOUS SYSTEMS THEREWITH

Kenneth B. Matthews, Swanscombe; Christine A. Beckett, Higham; David E. Smith, New Barn, and Richard R. Davidson, Cambridge, all of England, assignors to Blue Circle Industries, PLC, London, England

Division of Ser. No. 790,632, Oct. 22, 1985, Pat. No. 4,610,801, which is a continuation of Ser. No. 534,561, Sep. 22, 1983, abandoned. This application Jul. 29, 1986, Ser. No. 891,472

Claims priority, application United Kingdom, Sep. 24, 1982, 8227366

Int. Cl.[4] C02F *1/56*

U.S. Cl. 210—727 13 Claims

1. A method of treating an aqueous system in order to effect flocculation of particulate matter within the treated system, which method comprises the steps of (1) taking a composition comprising (a) an aqueous slurry of mineral particles of at least 40% m/m mineral solids concentration and (b) an agent or mixture of agents that at least substantially maintains the mobility of the slurry, such that the apparent viscosity of the slurry does not exceed 500 cP (as measured at a shear rate of 600 s^{-1}), and that exerts a flocculating action upon dilution of the composition with or into water at a dilution ratio of at least 20:1 (m/m), said agent(s) being selected from cationic polyelectrolytes that have nitrogen-containing groups, amphoteric polyelectrolytes that have nitrogen-containing groups and, provided that the said mineral particles include calcium hydroxide particles, anionic polyacrylamides, (2) adding to the aqueous system an amount of the said composition effective to cause flocculation of particulate matter in the resultant mixture and (3) separating the resultant flocculated particulate matter from the water of the aqueous system.

4,711,728

TREATING SPENT FILTER MEDIA

Roger E. M. Remacle, Lasne, and Alain A. J. Verbeeck, Brussels, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Jan. 13, 1986, Ser. No. 817,953

Int. Cl.[4] B01D *41/02*

U.S. Cl. 210—772 15 Claims

1. A process for treating additive-laden siliceous filter material, previously used to filter lubricating oil additives, to recover the sorbed additives therein, said process comprising the steps of:

(a) forming at room temperature, a slurry of the additive-laden siliceous filter material and an aromatic solvent, said solvent being added in sufficient amounts to give a weight ratio of solvent to additive of from about 0.25 to about 20;

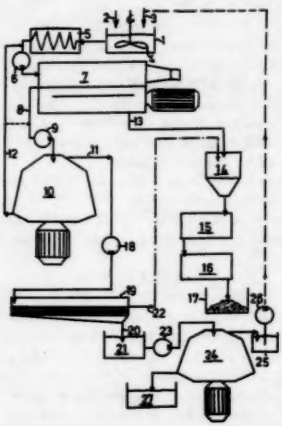
(b) adding water to said slurry, in an amount of from about 0.01 to about 5 parts per part of filter material;
(c) separating the siliceous filter material from the slurry to recover substantially additiven-free filter material; and
(d) recovering the additives from the aromatic solvent.

4,711,729

PROCESS FOR THE RECOVERY OF VALUABLE SUBSTANCES FROM LACQUER SLUDGE

Wolf-Dietrich Rudroff, Im Panskamp 44, D-4350 Recklinghausen, Fed. Rep. of Germany

PCT No. PCT/EP86/00258, § 371 Date Jan. 8, 1987, § 102(e) Date Jan. 8, 1987, PCT Pub. No. WO86/06657, PCT Pub. Date Nov. 20, 1986
PCT Filed May 2, 1986, Ser. No. 19,595
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516881
Int. Cl.[4] B01D *17/038*
U.S. Cl. 210—781 **7 Claims**



1. A process comprising: recovering valuable substances from lacquer sludge containing in addition to solvent, vehicle and adjuvants up to 50% by volume solids in the form of inorganic and/or organic pigments and/or fillers, by reducing the kinematic viscosity of the lacquer sludge to less than 100 cSt by adding up to 50% by volume solvent and/or by heating to 60° C., providing a decanting centrifuge, reducing the solids content of the liquefied lacquer sludge to less than 3% by volume first by accelerating in said decanting centrifuge (7) up to 4,000 g, providing a centrifugal separator and subsequently accelerating in said centrifugal separator (10) up to 14,000 g.

4,711,730

CAPPED 1,2-PROPYLENE TEREPHTHALATE-POLYOXYETHYLENE TEREPHTHALATE POLYESTERS USEFUL AS SOIL RELEASE AGENTS

Eugene P. Gosselink, Cincinnati, and Francis L. Diehl, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

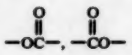
Filed Apr. 15, 1986, Ser. No. 852,257
Int. Cl.[4] C11D *17/00*; D06M *9/00*; C07C *69/76*
U.S. Cl. 252—8.75 **33 Claims**

1. A capped, substituted-ethylene terephthalate ester compound having oligomeric or polymeric backbone incorporating particular polyoxyethylene moieties, said compound having the formula:

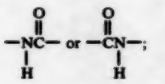
$$X—(OCH_2CH(Y))_u(OR^4)_m][(A—R^1—A—R^2)_u(A—R^1—A—R^3)_v]$$

$$—A—R^1—A—(R^4O)_m(CH(Y)CH_2O)_n]X$$

wherein the A moieties are selected from the group consisting of



and combinations thereof with either or both of the moieties



the R^1 moieties are selected from 1,4-phenylene moieties and combinations thereof with up to 50% of other arylene or alkarylene moieties, alkylene moieties, alkenylene moieties or mixtures thereof; the R^2 moieties are selected from (a) the group consisting of 1,2-propylene, 1,2-butylene, 3-methoxy-1,2-propylene and combinations thereof, and (b) combinations of the foregoing R^2 moieties with up to 20% of other compatible R^2 moieties; the R^3 moieties are selected from moieties $(CH_2CH_2O)_q—CH_2CH_2—$ wherein q is at least about 9, and from combinations thereof with up to 50% of other compatible R^3 moieties; each R^4 is C_3–C_4 alkylene, or the moiety $—R^2—A—R^5—$, wherein R^5 is a C_1–C_{12} alkylene, alkenylene, arylene or alkarylene moiety; the Y substituents of each moiety $—(R^4O)_m(CH(Y)CH_2O)_n]$ are H, the ether moiety $—CH_2(OCH_2CH_2)_pO—X$ or a mixture of said ether moiety and H; each X is H, C_1–C_4 alkyl or

wherein R^6 is C_1–C_4 alkyl; m and n are numbers such that the moiety $—(CH(Y)CH_2O)—$ comprises at least about 50% by weight of the moiety $—(R^5O)_m(CH(Y)CH_2O)_n—$, provided that when R^4 is the moiety $—R^2—A—R^5—$, m is 1; each n is at least about 6; p is 0 or at least 1; the average value of u is from about 2 to about 50; the average value of v is from about 1 to about 20; the average value of u + v is from about 3 to about 70.

10. A laundry detergent composition, which comprises
(a) from about 5 to about 75% by weight of a nonionic detergent surfactant;
(b) from 0 to about 15% by weight synthetic anionic detergent surfactants; and
(c) a soil release component having an effective amount of the compound of claim 1.

4,711,731

DRILLING FLUID DISPERSANT

Christopher M. Garvey, Princeton; Arpad Savoly, Martinsville, both of N.J., and Thomas M. Weatherford, Houston, Tex., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Feb. 6, 1986, Ser. No. 826,583
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.514 **8 Claims**

1. An aqueous clay containing drilling fluid having present, in an amount sufficient to disperse the fluid and to provide resistance to high temperatures and solids contamination of the drilling fluid, at least one salt of a polymer of acrylic or methacrylic acid having at least 50% by weight of acrylic or methacrylic acid with mixtures of lithium and alkanolamine, said alkanolamine containing from 2 to 12 carbon atoms, the polymer having a weight average molecular weight of between about 2,000 and about 15,000 and a pH of from about 6 to about

8.5, the amount of lithium being present to give from about 30% to about 70% of the desired neutralization of said polymer and the amount of alkanolamine being present to give from about 70% to about 30% of the desired neutralization of said polymer.

4,711,732

RADIATION-RESISTANT GREASE

Kazuo Arakawa; Naohiro Hayakawa; Kenzo Yoshida, all of Gunma; Tetsuya Yagi, Osaka, and Hiroshi Nakanishi, Hyogo, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Matsumura Oil Research Corporation, Hyogo, both of, Japan

Filed Mar. 25, 1986, Ser. No. 843,644
Claims priority, application Japan, May 28, 1985, 60-114657
Int. Cl.[4] C10M *113/08, 113/12*
U.S. Cl. 252—28 2 Claims

1. Radiation-resistant grease composed of:

(A) 70–97 wt % of a base oil composed of the following components:

a. 25–75 wt % of a phenyl ether based synthetic oil comprised of 0–70 wt % of o-(m-phenoxyphenoxy)diphenyl and 100–30 wt % of m-(m-phenoxyphenoxy)diphenyl; and

b. 75–25 wt % of a mono- and/or dialkyldiphenyl ether having 6–20 carbon atoms in a alkyl group; and

(B) 3–30 wt % of a bentonite based thickening agent.

4,711,733

LUBRICANT FOR THE PRODUCTION OF SEAMLESS TUBES

Noboru Kanda; Kenzou Yokoyama, both of Hiratsuka; Ken-ichi Aoki, Kanagawa; Shinji Akita, Yokohama; Masayuki Hatanaka, Yokohama, and Tatsuharu Oda, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Yushiro Chemical Industry Co., Ltd., both of, Japan

Continuation-in-part of Ser. No. 731,143, May 6, 1985, abandoned. This application Jun. 13, 1986, Ser. No. 875,885
Claims priority, application Japan, May 15, 1984, 59-95619
Int. Cl.[4] C10M *125/02, 173/02*
U.S. Cl. 252—29 8 Claims

1. A lubricant for the production of seamless tubes comprising water-insoluble fine synthetic resin particles, fine gilsonite particles and graphite as the essential ingredients together with water as required in addition to said essential ingredients, said lubricant comprising about 30 parts by weight of water-insoluble fine synthetic resin particles, from about 15 to about 30 parts by weight of fine gilsonite particles and from about 40 to about 55 parts by weight of fine graphite powder.

4,711,734

OILY PHASE DISPERSIONS EMPLOYING AN OIL-MISCIBLE DISPERSING AGENT

Takeshi Fujita, Kyoto, and Hironori Kataoka, Yamatokoriyama, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Aug. 18, 1982, Ser. No. 409,262
Int. Cl.[4] C10M *129/16, 129/18*
U.S. Cl. 252—52 A 16 Claims

1. In an oily composition comprising a uniform dispersion of insoluble particles in an oil, said dispersion being selected from the group consisting of

(i) particles of a fluorocarbon resin in a lubricating oil,

(ii) particles of SiO_2 in an oil coating composition, and

(iii) particles of magnesium hydroxide in bunker oil, the improvement wherein said oil contains an amount effective to maintain said particles uniformly dispersed therein of a dispersing agent consisting essentially of a mixture of

(a) a reaction product of a compound of a molecular weight of at least 1,000 and of the formula:

$$R^1\text{—}[(OCH_2CH_2)_x\text{—}OH]_y \quad \text{(I)}$$

wherein R^1 is an organic bridging group, x is an integer greater than 1, and y is an integer from 2 to 8, and a compound of the formula:

$$R^2\text{—}CH\text{—}CH_2 \quad \text{(II)}$$

(O)

wherein R^2 is a C_6–C_{40} alkyl or phenyl, the molar ratio of compound (II) to compound (I) being at least 1; and

(b) a lanolin fatty acid ester.

4,711,735

COOLANT ADDITIVE WITH CORROSION INHIBITIVE AND SCALE PREVENTATIVE PROPERTIES

Harold J. Gulley, 3321 E. 149th St., #2, Cleveland, Ohio 44120

Filed Sep. 12, 1986, Ser. No. 906,392
Int. Cl.[4] C09K *5/00*
U.S. Cl. 252—75 17 Claims

2. An additive for addition to a fluid mixture comprising the coolant fluid for an engine comprising, by weight:

about 2 percent sebacic acid, practical, about 0.2 percent ethoxylated nonylphenol, about 0.5 percent styrene maleic anhydride with a molecular weight of between 200 and 3500, about 0.1 percent polyoxyalkylene glycol, about 0.05 percent polypropylene glycol 1025, about 1.25 percent disodium tetraborate, 5 Mol. H_2O, about 7.05 percent sodium hydroxide 50%, and 0.6 percent ricinoleic acid, practical, about 1 percent mercaptobenzothiazole, dry 2-MBT (Azole), about 1.5 percent sodium benzoate, about 0.23 percent moiety of benzotriazole, about 2 percent sodium sarcosine, about 1.5 percent sodium nitrate, about 0.02 percent, about 0.8 percent N-benzylethanolamine and about 0.05 percent phenolphthalein.

4,711,736

SULFURIZED OLEFINS AS ANTIWEAR/EXTREME PRESSURE ADDITIVES FOR LUBRICANTS AND FUELS AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Derek A. Law, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 24, 1986, Ser. No. 831,967
Int. Cl.[4] C10M *133/16, 135/02*
U.S. Cl. 252—47.5 37 Claims

1. A multifunctional additive product having antiwear/extreme pressure, friction modifying and thermal or oxidative stability characteristics suitable for use in an oil of lubricating viscosity or grease thereof prepared in a process comprising reacting in a suitable reaction zone an olefinic-hydrocarbyl compound having at least one olefinic double bond with elemental sulfur, hydrogen sulfide, water and a polymeric succinimide having at least one free amine group.

4,711,737

N-TERT-BUTYL DERIVATIVES OF TOLUENEDIAMINE AND MIXTURES AS ANTIOXIDANT FOR ORGANIC MATERIALS

William F. Burgoyne, Jr., Allentown, and Dale D. Dixon, Kutztown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 24, 1986, Ser. No. 946,564
Int. Cl.[4] C09K *15/18;* C10M *133/12*
U.S. Cl. 252—77 6 Claims

1. In an organic material normally susceptible to gradual degradation in the presence of oxygen during use over an extended period of time and of the type in which an aromatic diamine has been added as an antioxidant, the improvement which comprises utilizing 2-(tert-butylamino)-6-aminotoluene as any aromatic diamine antioxidant.

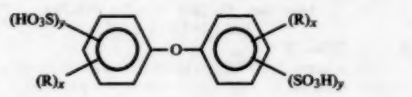
4,711,738

MECHANICAL DISHWASHING RINSE COMPOSITION HAVING A LOW FOAMING SULFONIC ACID RINSING AGENT AND A SOURCE OF ACTIVE HALOGEN

James L. Copeland, Burnsville, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Continuation of Ser. No. 646,257, Aug. 29, 1984, abandoned.
This application Jan. 21, 1986, Ser. No. 821,412
Int. Cl.[4] F01B *19/00*; F16J *3/00*
U.S. Cl. 252—95 18 Claims

1. A low foaming and sanitizing or bleaching rinse composition for machine warewashing which consisting essentually of:
(a) a major portion of an aqueous medium;
(b) about 2.5–15 wt-% based on the total weight of the composition of an active halogen compound; and
(c) an effective amount of a low foaming sulfonate rinse agent of the formula:



and the alkali metal or alkaline earth metal salts thereof, wherein x is 0 to 4, y is 0 to 4, the sums of x and y are at least one, and the sum of x and y is less than or equal to 6; and each R is independently a hydrogen or a C_1–C_9 alkyl group, at least one R is alkyl;
and wherein the rinse composition is free of significant amounts of alkaline detergent builder salts.

4,711,739

ENZYME PRESPOTTER COMPOSITION STABILIZED WITH WATER INSOLUBLE POLYESTER OR POLYETHER POLYOL

Thomas V. Kandathil, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 18, 1986, Ser. No. 943,226
Int. Cl.[4] C11D *3/20, 3/37, 3/386*; C12N *9/96*
U.S. Cl. 252—139 14 Claims

1. An improved water-in-oil prespotter laundry composition comprising:
(a) from about 0.1 to 1% by weight of at least one enzyme;
(b) from about 5 to 30% by weight of at least one ethoxylated nonionic surfactant;
(c) from about 0.2 to 5% by weight of at least one of a water insoluble polyester polyol having a hydroxyl number from about 28 to 690 or a water insoluble polyether polyol having a hydroxyl number from about 28 to 690;
(d) from about 0.1 to 10% by weight of at least one builder salt;
(e) from about 5 to 70% by weight of at least one hydrocarbon solvent; and
(f) the balance water; and having a pH in the range from about 5 to 9.

8. A method for producing an improved water-in-oil prespotter laundry composition having a pH in the range from about 5 to 9 comprising the steps of:
(1) mixing:
(a) from about 0.1 to 1% by weight of at least one enzyme;
(b) from about 5 to 30% by weight of at least one ethoxylated nonionic surfactant;
(c) from about 0.2 to 5% by weight of at least one of a water insoluble polyester polyol having a hydroxyl number from about 28 to 690 or a water insoluble polyether polyol having a hydroxyl number from about 28 to 690; and
(d) from about 5 to 70% by weight of at least one hydrocarbon solvent;
(2) blending from about 0.1 to 10% by weight of at least one builder salt in an aqueous carrier; and
(3) adding the mixture of (1) to the blend of (2).

4,711,740

DETERGENT COMPOSITIONS

Malcolm N. A. Carter, and Reginald V. Scowen, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 599,376, Apr. 12, 1984, abandoned.
This application May 23, 1986, Ser. No. 870,298
Claims priority, application United Kingdom, Apr. 22, 1983, 8311002
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.24 7 Claims

1. A detergent composition comprising:
(i) from 5 to 40% by weight of a detergent active material;
(ii) from 10% to 40% by weight of a water-soluble carbonate material;
(iii) from 5% to 60% of a water-insoluble carbonate material; and
(iv) from 0.2% to 5% by weight of a copolymer of maleic anhydride and a monomer selected from the group consisting of sulfonated styrene and 2-acrylamido-2-methyl propane sulfonic acid, wherein the weight ratio of said monomer to said maleic anhydride is about 3:1, said copolymer having a molecular weight of between 1,000 and 500,000.

4,711,741

DISOXIDANT COMPOSITION

Daishiro Fujishima, and Shinichiro Fujishima, both of 18-12, Asahi-cho, Sagamihara-shi, Kanagawa-ken, Japan

PCT No. PCT/JP84/00378, § 371 Date Mar. 25, 1985, § 102(e) Date Mar. 25, 1985, PCT Pub. No. WO85/00537, PCT Pub. Date Feb. 14, 1985
PCT Filed Jul. 26, 1984, Ser. No. 718,019
Claims priority, application Japan, Jul. 26, 1983, 58-136273
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—188.28 10 Claims

1. A disoxidant composition comprising, in combination, a metal component selected from the group consisting of iron, iron carbide and mixtures thereof possessing a disoxidation activity, and an electrolyte component comprising a halogen-containing oxyacid salt selected from the group consisting of sodium chlorite and calcium hypochlorite.

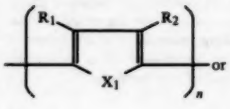
4,711,742

SOLUTION PROCESSIBLE FORMS OF NEUTRAL AND ELECTRICALLY CONDUCTIVE POLY(SUBSTITUTED HETEROCYCLES)

Kwan-Yue A. Jen, Flanders, and Ronald L. Elsenbaumer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 740,131, May 31, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 2,529
Int. Cl.[4] H01B *1/20*
U.S. Cl. 252—500 58 Claims

1. An electrically conductive solution comprising;
(a) an organic solvent other than a chloroalkane;
(b) a dopant solute; and
(c) a doped homopolymer or co-polymer of film forming molecular weight, said polymer of the formula



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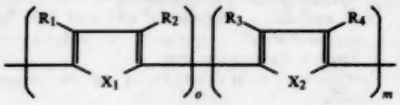


wherein:

n is a natural number and greater than 100;

o and m are the same or different and are natural numbers wherein the sum of o and m is greater than 100, wherein the ratio of m to o can vary from zero to infinity;

R_1 is alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkylaryl, arylalkyl, cycloalkyl, alkylsulfinyl, alkylsulfonyl, aryl, arylthio, cycloalkenyl, arylsulfinyl, arylsulfonyl, or alkyl substituted with a sulfonic acid, halo, nitro, cyano, carboxylic acid or epoxy moiety;

R_2, R_3, and R_4 are the same or different and are hydrogen, methyl or R_1; or any of

R_1 and R_2, or R_3 and R_4 substituents taken together are an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered ring system, which ring may optionally include one or more divalent heteroatoms of sulfur, sulfinyl, sulfonyl or oxygen; and

X_1 and X_2 are the same or different and are divalent S, O, Se, NR^5 or PR^5, wherein R^5 is hydrogen, alkyl or aryl.

4,711,743

PROCESS FOR PRODUCING ANTHRAQUINONE-1-SULPHONIC ACID BY SULPHONATION WITH PALLADIUM CATALYST

Feng-Feng Wey, Hsinchu, Taiwan, assignor to 501 China Technical Consultants, Inc., Taipei, Taiwan

Filed Jan. 21, 1987, Ser. No. 5,996
Int. Cl.[4] C07C *143/36*
U.S. Cl. 260—370 **9 Claims**

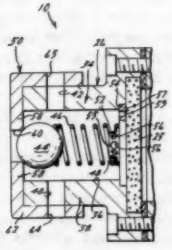
1. In a process for the production of anthraquinone-1-sulphonic acid by sulphonating anthraquinone with a sulphonating agent in the presence of palladium catalyst in a solvent, an improvement comprising: before sulphonation, mixing the palladium with nitric acid or mineral acids containing nitric acid at room temperature and then removing the acid from the treated palladium.

4,711,744

STARTING AID FOR SMALL INTERNAL COMBUSTION ENGINES

William A. Scott, Mt. Zion, and Carl Dull, Decatur, both of Ill., assignors to Tillotson, Ltd., Tralee, Ireland

Filed Apr. 4, 1986, Ser. No. 848,409
Int. Cl.[4] F02M *1/14*
U.S. Cl. 261—64.4 **4 Claims**



1. An improved choke for small internal combustion engines having a carburetor, a bore operatively associated with the carburetor, the bore having one end in communication with a source of combustion air and another end of the bore in communication with a piston cylinder of the internal combustion engines, said choke comprising:

means coupled with said bore for controlling an amount of combustion air entering the bore, said means including a first member coupled with the combustion air end of said bore for enabling combustion air to enter said bore upon start-up of said engine, an inertia valve means positioned in said bore and associated with said first member for controlling said amount of combustion air entering said bore upon start-up of said engine, a second member coupled with the combustion air end of said bore for enabling combustion air to enter said bore after start-up of said engine, and

resilient biasing means for securing in said bore for resiliently securing said inertia valve means in said bore and in association with said first member,

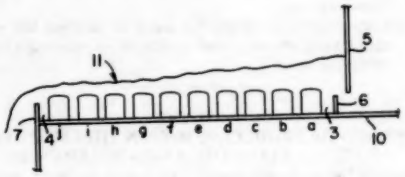
wherein said inertia valve means is responsive to vibration of said internal combustion engine to nonlinearly control said amount of combustion air entering said bore subsequent to combustion in said engine.

4,711,745

HIGH TURNDOWN BUBBLE CAP TRAY

Michael J. Lockett, Grand Island; Daniel R. Summers, North Tonawanda, both of N.Y.; Vinson C. Smith, and James C. Upchurch, both of Houston, Tex., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 8, 1987, Ser. No. 1,419
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—114.2 **8 Claims**



1. A bubble cap tray having a tray deck, a liquid inlet zone having an inlet weir and a liquid outlet zone having an outlet weir, capable of establishing a liquid level on the tray deck which generally decreases in height from the inlet zone to the outlet zone, and a plurality of bubble caps disposed in rows which are serially disposed on the tray deck from the inlet zone to the outlet zone, characterized by:

(a) each bubble cap having a plurality of triangular-shaped openings;

(b) the total area of said openings on each bubble cap being substantially equal;

(c) each row not proximate the inlet zone having bubble caps with openings whose uppermost portion is at about the same distance beneath the liquid level; and

(d) each row proximate the inlet zone having bubble caps with openings whose uppermost portion is closer to the liquid level than is the uppermost portion of the openings of the bubble caps in rows not proximate the inlet zone.

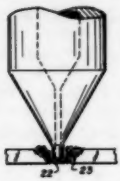
4,711,746
PROCESS FOR WELDING THERMOPLASTIC BY INJECTION

Clarence H. Drader, 52073 Highway 21, Sherwood Park, Alberta, Canada T8B 1J4

Continuation-in-part of Ser. No. 669,075, Nov. 7, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 791,148

Int. Cl.[4] **B29C** *35/02, 45/14, 65/02;* **B32B** *35/00*

U.S. Cl. 264—36 **2 Claims**



1. A process for welding a crack or junction line in a workpiece formed of thermoplastic material using a dispensing device comprising a barrel forming an internal chamber and having a nozzle forming a restrictive orifice outlet in its tip, said tip having a thickness greater than that of the crack or junction line, said device comprising means for forcing filler plastic into the chamber, and means for heating the barrel including its nozzle tip, comprising:

(a) filling the chamber with filler plastic;

(b) heating the chamber contents and nozzle sufficiently to render molten the plastic in the chamber and to render molten the workpiece plastic immediately adjacent the crack or junction line at the nozzle tip when the tip is applied thereto;

(c) penetrating the hot nozzle tip into the workpiece at the crack or junction line to render molten said adjacent workpiece plastic and submerge the tip therein and simultaneously feeding additional filler plastic into the chamber at a rate sufficient to cause molten filler plastic to be injected at high pressure through the orifice outlet of the submerged tip into the molten workpiece plastic, to fuse therewith; and

(d) drawing the tip along the crack or junction line while maintaining the steps and conditions of paragraph (c), to effect the weld.

4,711,747
METHOD OF PRODUCING BLOWN THERMOPLASTIC FOIL WITH LOW THICKNESS TOLERANCES

Hartmut Halter, Ruppichteroth, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co., Troisdorf, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,170

Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518155

Int. Cl.[4] **B29C** *47/92*

U.S. Cl. 264—40.2 **10 Claims**

1. A method of producing a thermoplastic synthetic resin foil with reduced thickness tolerances, comprising the steps of:

extruding a tubular stream of hot thermoplastic synthetic resin through an annular nozzle of a foil blowing head;

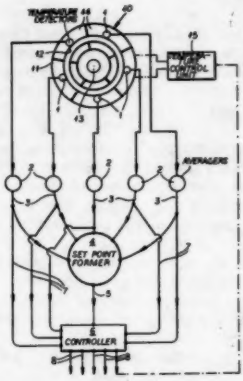
blowing the tubular stream emerging from said nozzle to expand said stream into a thin-wall foil tube and thereafter cooling said tube to stabilize the resulting foil;

subdividing said nozzle into a plurality of independently temperature controllable sectors around the periphery of said stream and the temperatures of which control at least in part the thickness of said foil tube in corresponding regions;

detecting the temperature of a mass flow of the hot thermoplastic synthetic resin emerging from said annular nozzle around the periphery of said mass flow and at a location upstream of complete expansion of said tubular stream;

averaging said temperature of said mass flow for specific regions thereof corresponding to said sectors to form respective average values;

forming a set point value from at least one of said average values;



comparing each of said average values with said set point value and generating a respective control signal for each sector upon deviation of said average values from said set point value; and

controlling the temperature of each of said sectors with the respective control signals.

4,711,748
PREPARATION OF BLEACH CATALYST AGGREGATES OF MANGANESE CATION IMPREGNATED ALUMINOSILICATES BY HIGH VELOCITY GRANULATION

Charles F. Irwin, Randolph, N.J.; William Karpusiewicz, Floral Park, and Patricia Liberati, Yonkers, both of N.Y., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 805,529, Dec. 6, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 926,708

Int. Cl.[4] **B01J** *29/16, 37/02;* **B29C** *67/02;* **C11D** *3/395*

U.S. Cl. 264—117 **20 Claims**

1. A process for the preparation of bleach catalysts in aggregate form, exclusive of any peroxide compound within the aggregate, comprising the steps of:

(i) adsorbing a manganese (II) cation onto an aluminosilicate support material having an average diameter size of about 2 to 10 microns, the ratio of manganese (II) cations to aluminosilicate ranging from about 1:1000 to 1:10, the combined weight of manganese (II) cation and aluminosilicate support material being from 1 to 99% of the total catalyst;

(ii) granulating a wet mass by subjecting aggregates of said wet mass to collisions having a velocity greater than 10 meters/sec said wet mass comprising aluminosilicate support material, with manganese (II) cations adsorbed thereon, in the presence of from about 0.1 to 40% of a binder, the amount based on a dry solids weight content of the total aggregate, and wherein neither the aggregates nor their components have a pH of more than 10; and

(iii) drying the resultant aqqreqates and wherein at least 70% of said dried aggregates have a diameter size ranging from at least 250 to about 2000 microns.

4,711,749

PROCESS FOR PRODUCING MICROCAPSULES

Takao Kosaka, Himeji; Fumio Okumura, Takasago, and Hirokazu Tsukahara, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,874
Int. Cl.[4] B01J 13/02
U.S. Cl. 264—4.7 6 Claims

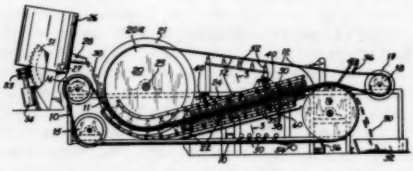
1. A process for producing microcapsules containing a hydrophobic material as core material, which comprises polymerizing at least one water-soluble vinyl monomer in an aqueous solution of oil-soluble vinyl monomer-maleic anhydride-maleic ester multipolymer to prepare a water-soluble resin, dispersing or emulsifying a hydrophobic material in an acidic aqueous solution of the resulting water-soluble resin to form fine discrete particles, combining an amino resin precursor separately prepared with the dispersion or emulsion, and reacting the precursor by heating the mixture in an acidic state to form capsule walls, whereby the capsule emulsion produced has low viscosity and high whiteness and is useful for preparing recording sheets substantially free from black spots.

4,711,750

ABRASIVE CASTING PROCESS

John J. Scott, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Division of Ser. No. 30,501, Apr. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 861,836, Dec. 19, 1977, abandoned. This application Jul. 15, 1981, Ser. No. 283,600
Int. Cl.[4] B29B 9/04
U.S. Cl. 264—144 4 Claims



1. Process for rapidly chilling molten metal oxide to form thin fractured sheets of finely crystalline solid oxide, comprising the steps of advancing a pair of metallic belts into face-to-face position, applying a cooling liquid to the back surfaces of the belts as they move into face-to-face position, pouring a molten oxide into the nip between the approaching faces of the belts, and advancing said belts from the pouring position to a discharge position where the belts are separated and the solidified oxide sheets are discharged therefrom, the belts being passed around a convex surface as they leave the pouring position so that in the absence of poured oxide the belts would be in face-to-face contact, whereby the spacing between the belts as they pass around the convex surface is controlled by the amount of oxide poured into the nip and the speed of movement of the belts.

4,711,751

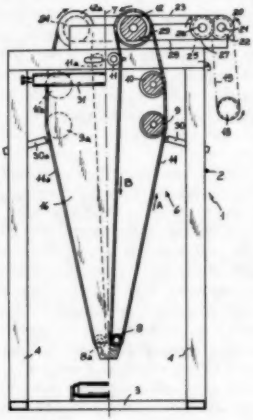
PROCESS AND APPARATUS FOR STRETCHING TUBULAR EXTRUDED PLASTIC MATERIAL

Lance W. Tipton, Ashtabula, Ohio, assignor to Thermo Plastic Research Co., Ltd.

Filed Jan. 11, 1985, Ser. No. 690,680
Int. Cl.[4] B29C 55/26
U.S. Cl. 264—159 10 Claims

1. A process of stretching tubular extruded plastic material comprising the steps of placing a substantial portion of a wedge-shaped means having a vertex end and a base end into a fluid heating means, said wedge-shaped means being formed by belt means traveling over appropriate pulleys, with a first pair of pulleys forming a vertex end, and a second pair of pulleys forming the base of the wedge-shaped means, dipping the tubular plastic material into said heating means and onto the vertex end of said wedge-shaped means, driving the first pair of pulleys at a circumferential speed less than the second pair of pulleys, said belt means accommodating the speed differential between the first and second pair of pulleys, contacting the inner surface of the plastic tube with the belt means to move the plastic tube toward the base of the wedge-shaped means and thereby stretching the plastic tube, cutting said tube moving forward along the wedge-shaped member close to both sides of said wedge-shaped member by means of cutting means disposed in the vicinity of the base of the wedge to provide two separate plastic sheets; and finally moving the two separate sheets thus obtained over idler rollers.

5. Apparatus for stretching tubes made or extruded plastic material coming out of an extruder comprising: a substantially flat and wedge-shaped means disposed on a bearing casing, said wedge-shaped means being formed by a plurality of driving and idler pulleys disposed symmetrically two by two with respect to a vertical median plane and substantially defining a wedge with a vertex end and a base end, said vertex end being

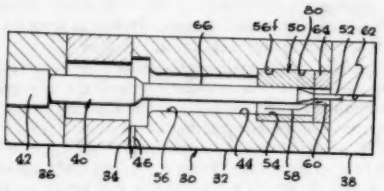


formed by a first pair of pulleys being separated by said vertical median plane, said first pair of pulleys being sized and spaced a predetermined distance apart so as to fit within the extruded plastic tube placed thereover, said base end being formed by a second pair of pulleys spaced a predetermined distance apart and further apart than said first pair of pulleys to form a wedge-shape which will stretch the plastic tube, belt means connecting the pulleys to each other, said belt means being adapted to contact the inner surface of the extruded plastic tube to move said plastic tube from the vertex toward the base of the wedge-shaped means, said first pair of pulleys being driven at a lesser circumferential speed than the second pair of pulleys and said belt means accommodating the speed differential between the first and second pair of pulleys, a pair of cutting members positioned a predetermined distance above said vertex and adapted to cut the extruded plastic tube into two distinct sheets after it is stretched, a pair of idler rollers disposed on two opposite faces of the wedge-shaped means in order to move the two distinct sheets away from the processing area in opposite directions, and drive means being provided for driving the pulleys.

4,711,752
METHOD AND APPARATUS FOR MOLDING FIBER OPTIC CONNECTOR FERRULE

George R. Deacon, Corona Del Mar, and William R. Cranford, Irvine, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,301
Int. Cl.[4] B29C 45/36
U.S. Cl. 264—328.12 7 Claims



1. A method for forming a fiber optic connector ferrule, comprising:

mounting the rear of an elongated corepin on the rear end of an injection mold which has an elongated mold cavity, so the corepin extends throughout the length of the mold cavity, said corepin having a reduced-diameter forward section of about the same diameter as the bare fiber of an optical fiber cable that is to be held by the ferrule and a middle section rearwardly spaced from the forward end of the corepin and having a greater diameter than said forward section;

installing a bushing which has a ring-shaped outside and at least three radially-inwardly extending arms, within said mold cavity, with the radially inner ends of the arms closely surrounding the front of the middle section of the corepin, and with the inner surface of a group of tying portions of the bushing which connect the radially outer ends of the arms, forming an interrupted cylinder which is precisely concentric with the inner ends of said arms;

injecting a molten plastic into the mold cavity from a location which is rearward of said bushing, and flowing said plastic forwardly through the spaces between the arms of said bushing to form a plastic ferrule; and

removing said ferrule from said mold cavity, removing said corepin from said bushing, and removing bushing from around said ferrule.

2. Apparatus for molding a fiber optic connector ferrule so its inside can hold the optic fiber, lying at the forward end of a stripped optical fiber cable, precisely concentric with a substantially cylindrical mating surface near the end of the ferrule, comprising:

a mold which forms an elongated mold cavity defining most of the periphery of a ferrule, said mold cavity including a largely forward portion;

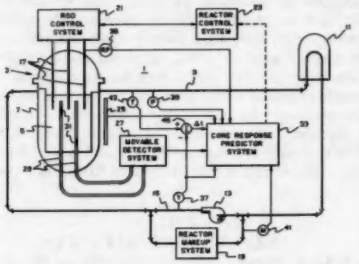
an elongated corepin for forming most of the inside of the ferrule, said corepin having a rearward end mounted on said mold and having a substantially cylindrical middle section and a smaller reduced diameter forward section of substantially the same size as an optic fiber; and

a bushing lying within the forward portion of said mold cavity and surrounding said cylindrical middle section of said corepin, said bushing having a plurality of radially-extending arms that have radially-inner ends that closely surround said corepin and radially outer ends, said radially outer ends lying radially opposite the radially-inner ends where the radially-inner ends closely surround said corepins and said radially outer ends being closely received within said mold, said arms being angularly spaced apart substantially at their radially inner ends to leave gaps through which molding material can flow forwardly to enter the extreme forward portion of said cavity.

4,711,753
CALIBRATION OF A NUCLEAR REACTOR CORE PARAMETER PREDICTOR

Albert J. Impink, Jr., Murrysville; Toshio Morita, Wilkensburg, Reno W. Miller, Penn Hills, and Louis R. Grobmyer, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1986, Ser. No. 841,498
Int. Cl.[4] G21C 7/36
U.S. Cl. 376—216 25 Claims



1. A method of calibrating, for neutron balance and power distribution, an on-line nuclear reactor core performance predictor which utilizes a one dimensional diffusion theroy core model incorporating elevation dependent neutronics parameters including macroscopic cross-sections, diffusion coefficients and transverse buckling factors, said method comprising the steps of: periodically adjusting the buckling factors by:

measuring the power distribution with the core in equilibrium at power;

concurrently measuring a set of controllable parameters which influence overall neutron balance in the core;

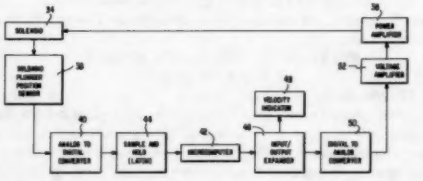
selecting a distribution expression for the elevation dependent transverse buckling factors having-expansion coefficients which include a coefficient correlated to the overall neutron balance and the remainder correlated to power distribution; and

adjusting said expansion coefficients such that the overall neutron balance and power distribution generated by said one dimensional diffusion theory core model, using said selected transverse buckling distribution expression, agree within preset tolerances with the measured power distribution and the overall neutron balance for actual core conditions represented by the measured values of said set of controllable parameters.

4,711,754
METHOD AND APPARATUS FOR IMPACTING A SURFACE WITH A CONTROLLED IMPACT ENERGY

Fred H. Bednar, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1985, Ser. No. 788,981
Int. Cl.[4] G21C 17/00; C05F 3/00
U.S. Cl. 376—245 16 Claims



7. Apparatus for impacting a surface with a desired kinetic impact energy comprising, in combination:

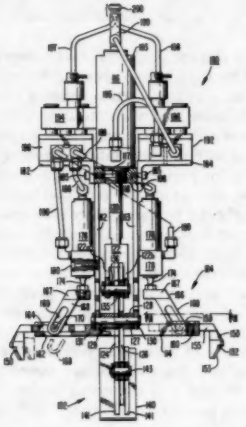
first means for applying a controllable impact force, corresponding to the magnitude of an input signal, to an adjacent surface;
second means, responsive to an input control signal, for supplying an input signal of a preset magnitude to said first means to produce said impact force;
third means for determining the kinetic energy of the impact;
fourth means for comparing the kinetic energy of the impact with a desired kinetic energy value and for producing an output signal corresponding to any difference;
fifth means for indicating the results of such comparison;
sixth means, responsive to said output signal from said fourth means for adjusting said preset magnitude of said input control signal to reduce any error; and
seventh means for supplying said input control signal at desired times to initiate an impact.

4,711,755

HANDLING TOOL FOR, AND METHOD OF USE OF, ICE BASKET REMOVABLE CRUCIFORM

Charles M. Scrabis, Pittsburgh; Gregory E. Mazza, Bethel Park; Leonard R. Golick, Levelgreen, and Paul Pomaibo, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,116
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—260 **8 Claims**



3. A method for selectively installing and removing a removable cruciform of a resiliently compressible type, in and from the interior of a generally cylindrical, elongated and vertically oriented ice containment structure, which interior is accessible from an open, upper end thereof, each such removable cruciform comprising a central housing defining an axis of compression and expansion, means normally biasing said housing in the direction of expansion, legs extending from said housing in a generally radially oriented direction and means on the outer edges of said legs configured to engage a corresponding stiffening ring rigidly secured on the interior of the cylindrical sidewall of the ice basket, comprising:

providing a handling tool having an elongated frame defining an axis, guide means connected to said frame and comprising at least first and second guide fingers extending radially from said axis and angularly displaced thereabout and selectively moveable between retracted and extended positions, and clamping means mounted to said frame and extending axially outwardly therefrom, said clamping means comprising a pair of clamping shoes selectively moveable in complementary directions relatively to the frame axis, radially inwardly to engaged positions and radially outwardly to disengaged positions, the radially outward and disengaged positions thereof being of lesser extent than the radially outward extent of said first and second guide fingers in either of said retracted and extended positions thereof;

positioning said tool, with said clamping shoes in said disengaged positions, in axial alignment with and disposed radially outwardly about the central housing of a removable cruciform of said resiliently compressible type;

selectively actuating said clamping means to said engaged positions of said clamping shoes for engaging and compressing the central housing of the cruciform and retracting the legs thereof;

lowering the tool with the cruciform engaged thereby, axially downwardly through the ice basket to a desired elevation;

selectively actuating said guide fingers of said tool to the extended positions thereof for engaging said guide fingers on a stiffening ring of the ice containment structure at the desired elevation;

selectively actuating the clamping means for moving said clamping shoes to the disengaged positions thereof to enable the central housing of the cruciform to expand and project the legs thereof radially outwardly for engaging the stiffening ring at the desired elevation;

selectively actuating said guide fingers to the retracted position thereof for releasing same from the stiffening ring; and

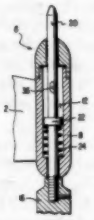
vertically axially withdrawing the tool from within the ice containment structure.

4,711,756

CONTROL ROD DISPLACEMENT

Susumu Nakazato, Tokyo, Japan, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 763,722, Aug. 8, 1985, abandoned. This application Feb. 24, 1987, Ser. No. 18,820
Int. Cl.[4] G21C *7/10*
U.S. Cl. 376—327 **9 Claims**



1. In a nuclear reactor including a core, a plurality of cylindrical control rods, a single support means supporting said plurality of control rods from their upper ends in spaced apart positions and movable for displacing said control rods in their longitudinal direction between a first end position in which said control rods are fully inserted into said core and a second end position in which said control rods are retracted from said core, and guide means contacting discrete regions of the outer surface of each said control rod at least when said control rods are in the vicinity of the second end position, said control rods being supported by said support means for longitudinal movement without rotation into and out of said core relative to the guide means to thereby cause the outer surface of said control rods to experience wear as a result of sliding contact with the guide means, said support means being so arranged with respect to said core and said guide means that it is incapable of rotation relative to said guide means, the improvement comprising a plurality of displacement means each of said plurality of displacement means being operatively coupled to a respective one of said control rods for periodically rotating said

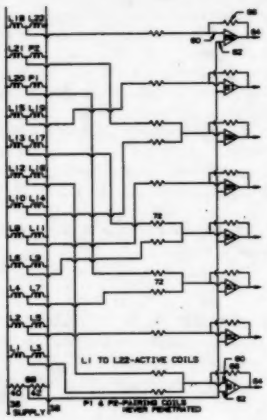
control rod in a single angular direction through an angle selected to change the locations on the outer surfaces of said control rods at which said control rods are contacted by said guide means during subsequent longitudinal movement of said control rods.

4,711,757

POSITION INDICATING DEVICE

Michal M. Feilchenfeld, Pittsburgh, and Grant R. Connors, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1986, Ser. No. 833,933
Int. Cl.[4] G21C *17/00*; G01R *33/00*
U.S. Cl. 376—258 9 Claims



1. Position indicating device for producing an indication of the position of a displaceable structure, said device comprising:

a position representing member mounted for movement in response to displacement of the structure, said member being movable along a defined path from a starting point such that the distance to which said member extends from the starting point corresponds to the position of the structure;

a plurality of sensing elements spaced apart along the defined path such that each said element is associated with a respective location along the defined path, each said element being operative to respond to the presence of said member when said member extends from the starting point to the respective location associated with that said element;

means operatively coupling said elements into respective pairs of elements, said means having, for each pair of elements, an output producing a signal only when a single element of its respective pair is responding to the presence of said member, said elements of each said pair being spatially separated from one another by at least one said element of a different said pair;

a plurality of signal producing members each operative for producing a signal representing a predetermined logic state in response to a predetermined input signal, the number of said signal producing members being smaller than the number of said sensing elements; and

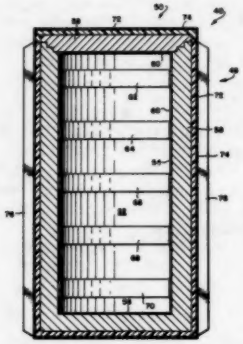
circuit means operatively connecting said outputs to said signal producing members for causing a signal at each said output to produce a predetermined input signal at a corresponding signal producing member and for causing a predetermined input signal to be produced at at least one said signal producing member whenever a signal is present at either one of at least two of said outputs.

4,711,758

SPENT FUEL STORAGE CASK HAVING BASKET WITH GRID ASSEMBLIES

Octavio J. Machado; David A. Daugherty, both of Pensacola; Ronnie H. Andrews, Cantonment, and Larry E. Efferding, Pensacola, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 686,041, Dec. 24, 1984, abandoned. This application Feb. 21, 1985, Ser. No. 703,855
Int. Cl.[4] G21C *19/32*; G21F *5/00*
U.S. Cl. 376—272 19 Claims



1. A cask for storage of nuclear fuel, comprising:

a container having a cavity therein, the cavity including a top portion, a bottom portion defining a floor, and a generally cylindrical side wall extending between the top and bottom portions, the side wall having a plurality of annular regions with different inner diameters; and

basket means for providing a plurality of elongated storage slots to receive the nuclear fuel, said basket means including a plurality of grid assemblies with circular peripheries and different diameters, and means for coaxially mounting said grid assemblies at spaced-apart positions so that the periphery of each grid assembly faces a respective annular region, said grid assemblies being dimensioned to permit insertion of said basket means into said cavity and to expand into pressing contact with said annular regions during storage of the nuclear fuel in order to facilitate the transfer of heat from said basket means through the peripheries of said grid assemblies to said annular regions, the pressing contact extending for 360° about the periphery of each grid assembly,

wherein the diameters of said grid assemblies and the inner diameters of said annular regions decrease from the top portion to the bottom portion of said container.

4,711,759

REMOVABLE CRUCIFORM FOR ICE CONDENSER ICE BASKET

Charles M. Scrabis, Pittsburgh; Gregory E. Mazza, Bethel Park; Leonard R. Golick, Levelgreen, and Paul Pomaibo, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,113
Int. Cl.[4] G21C *9/00*
U.S. Cl. 376—284 12 Claims

1. A removable cruciform for use in an ice basket having a generally cylindrical sidewall defining a central, vertical axis of the ice basket and plural, generally annular retaining rings secured to the interior of the cylindrical sidewall of the ice basket at predetermined, spaced elevations throughout the axial height of the ice basket, comprising:

a pair of brackets, each comprising a central, base portion having parallel longitudinal edges and a pair of integral

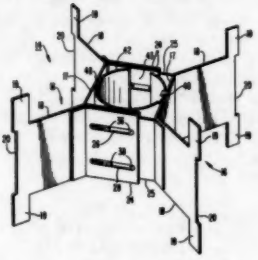
legs extending at corresponding angles relative to said base portion from the respective parallel longitudinal edges thereof;

a pair of support plate assemblies secured to and extending in parallel, spaced relationship from one of said pair of brackets, generally perpendicular to said base portion thereof, each said support plate assembly defining a corresponding slide channel;

a pair of slide support plates secured to the other of said pair of brackets and extending therefrom in spaced, parallel relationship, and received in telescoping, sliding relationship in the corresponding slide channels of the pair of respective support plate assemblies of said one of said brackets thereby to dispose said base portions of said pair of brackets in parallel, spaced relationship and defining therewith a housing of nominally, generally square configuration; and

spring means received within said housing and engaging said base portions of said brackets and applying a resilient biasing force thereto for maintaining said spaced relationship thereof.

7. A nuclear reactor system having an array of ice baskets disposed thereabout, each said ice basket having a generally cylindrical sidewall and plural, annular retaining rings secured to the interior surface of the sidewall at predetermined, spaced elevations throughout the axial height of the ice basket, removable cruciforms being mounted within said ice basket at predetermined, spaced elevations therewithin displaced from the



open, upper end of the ice basket and defining therewithin corresponding compartments, each to be charged with ice, each said removable cruciform, when so mounted, engaging a corresponding, annular retaining ring for supporting a charge of ice received in the corresponding compartment thereabove, and comprising:

a pair of brackets, each comprising a central, base portion having parallel longitudinal edges and a pair of integral legs extending at corresponding angles relative to said base portion from the respective parallel longitudinal edges thereof;

a pair of support plate assemblies secured to and extending in parallel, spaced relationship from one of said pair of brackets, generally perpendicular to said base portion thereof, each said support plate assembly defining a corresponding slide channel;

a pair of slide support plates secured to the other of said pair of brackets and extending therefrom in spaced, parallel relationship, and received in telescoping, sliding relationship in the corresponding slide channels of the pair of respective support plate assemblies of said one of said brackets thereby to dispose said base portions of said pair of brackets in parallel, spaced relationship and define therewith a housing of nominally, generally square configuration; and

spring means received within said housing and engaging said base portions of said brackets and applying a resilient force thereto for maintaining said spaced relationship thereof.

4,711,760

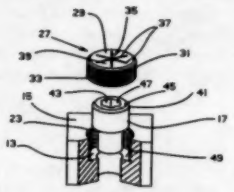
NUCLEAR REACTOR INCORPORATING LOCKING DEVICE FOR THREADED BOLT CONNECTIONS

Ronald M. Blaushild, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1986, Ser. No. 834,094

Int. Cl.[4] G21C *1/01*; F16B *37/04*

U.S. Cl. 376—399 **19 Claims**



1. A nuclear reactor having a pressure vessel and a first element comprising a core barrel situated within the pressure vessel, the core barrel having a baffle former secured in and to said core barrel by bolted connections, and a second element comprising a plurality of baffle plates secured to the inner surface of said baffle former by bolted connections, with a locking device to prevent loosening of bolted connections between the baffle former and at least one of said elements, where the baffle former and said at least one element are held together by a headed, threaded bolt engaged in a bore coaxially extending in said baffle former and said at least one element and threadedly engaged in a threaded section in at least said baffle former, said threaded section having first threaded of a first direction, with the head of the bolt engaged with a shoulder about the bore in said at least one element to hold said baffle former and said at least one element together, the head of said bolt having a first diameter and a cavity, having an unsymmetrical wall thereabout, in the end surface thereof, comprising:

a recess in said at least one element coaxial with said bore forming a wall thereabout and extending inwardly from the outer surface of said at least one element, said recess having a second diameter greater than said first diameter, with said at least one element having second threads in said wall of a direction opposite the direction of the first threads of said threaded bore;

a locking nut having a base with a downwardly depending cylindrical wall thereabout, the outer surface of the cylindrical wall having threads engageable with the second threads on the wall of said recess and of the same direction thereof; the base having a central aperture therethrough and downwardly extendable projections on said base adjacent said aperture, such that said downwardly extendable projections, when the base of said lock nut is positioned flush with the end surface of said bolt, engage with the unsymmetrical walls of the cavity in the head of said bolt.

12. A locking device to prevent loosening of a bolted connection between first and second components where the two components are held together by a headed, threaded bolt engaged in a bore coaxially extending in said components and threadedly engaged in a threaded section in at least said first component, said threaded section having first threads of a first direction, with the head of the bolt engaged with a shoulder about the bore in the second said component to hold said components together, the head of said bolt having a first diameter and a cavity, having an unsymmetrical wall thereabout, in the end surface thereof, comprising:

a recess in said second component coaxial with said bore forming a wall thereabout and extending inwardly from the outer surface of said second component, said recess having a second diameter greater than said first diameter, with said second component having second threads in said

wall of a direction opposite the direction of the first threads of said threaded bore;

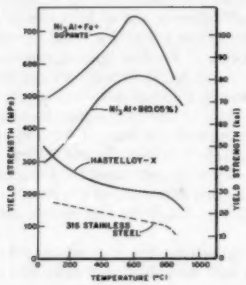
a locking nut having a base with a downwardly depending cylindrical wall thereabout, the outer surface of the cylindrical wall having threads engageable with the second threads on the wall of said recess and of the same direction thereof; the base having a central aperture therethrough and downwardly extendable projections on said base adjacent said aperture, such that said downwardly extendable projections, when the base of said lock nut is positioned flush with the end surface of said bolt, engage with the unsymmetrical walls of the cavity in the head of said bolt.

4,711,761

DUCTILE ALUMINIDE ALLOYS FOR HIGH TEMPERATURE APPLICATIONS

Chain T. Liu, and Carl C. Koch, both of Oak Ridge, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Aug. 3, 1983, Ser. No. 519,941
Int. Cl.[4] C22C *19/00*
U.S. Cl. 420—459 **5 Claims**



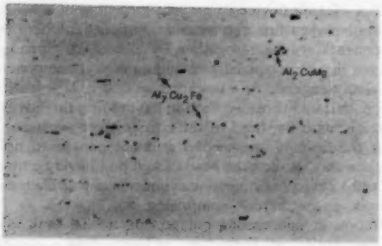
2. An alloy consisting essentially of about 9.0 to 11.5 wt.% aluminum, about 6.0 to 16 wt.% iron, about 0.01 to 0.07 wt.% boron, and the balance nickel.

4,711,762

ALUMINUM BASE ALLOYS OF THE A1-CU-MG-ZN TYPE

William D. Vernam, and Bernard W. Lifka, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 22, 1982, Ser. No. 421,341
Int. Cl.[4] C22C *21/10*
U.S. Cl. 420—532 **26 Claims**



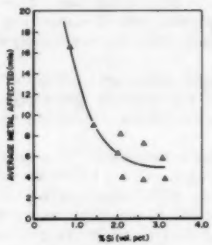
1. An improved aluminum base alloy product consisting essentially of 1.0 to 2.6 wt.% Cu, max. 0.3 Mn, 1.0 to 3.1 wt.% Mg. 4.0 to 8.2 wt.% Zn, 0.005 to 0.5 wt. % Sr, max. 0.18 Zr, max. 0.25 Cr, max. 0.4 Fe, max. 0.5 Si, the remainder aluminum and incidental elements and impurities.

4,711,763

SULFIDATION-RESISTANT CO-CR-NI ALLOY WITH CRITICAL CONTENTS OF SILICON AND COBALT

George Y. Lai, Carmel, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Dec. 16, 1986, Ser. No. 942,322
Int. Cl.[4] C22C *30/00*
U.S. Cl. 420—585 **4 Claims**



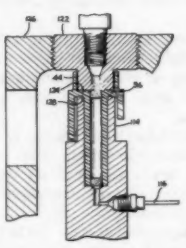
1. An alloy eminently suited for sulfidation resistance consisting essentially of, in percent by weight, 25 to 40 cobalt, 25 to 35 chromium, up to 20 iron, more than 2 to 4 silver, up to 8 each molybdenum and tungsten but not over 12 molybdenum plus tungsten, columbium plus tantalum up to 1, aluminum up to 1.3, titanium up to 1.3, carbon up to 2, Rare Earth Metals up to 0.2, zirconium and boron each up to 0.1, manganese up to 2, balance nickel plus impurities whereby the critical contents of cobalt and silicon are present to provide improved sulfidation resistance.

4,711,764

AUTOMATIC SAMPLE INJECTOR AND DISPOSABLE SAMPLE CASSETTE

Thomas J. Good, Sierra Madre, Calif., assignor to Analytichem International, Inc., Harbor City, Calif.

Continuation of Ser. No. 433,514, Oct. 8, 1982, abandoned. This application Oct. 24, 1985, Ser. No. 790,861
Int. Cl.[4] G01N *31/08*
U.S. Cl. 422—65 **5 Claims**



1. For use in an automatic sample injector for high pressure chromotography, the combination comprising:

a unitary molded plastic sample holder having a plurality of integral cylindrical sample columns disposed in a row therein open at both ends thereof and being supported in the sample holder by a single common flange surrounding each sample column, said flange disposed adjacent one end of said sample columns;

receiving means for receiving said sample holder;

sealing means for controllably sealably engaging one of said

plurality of sample columns at said single common flange and for releasing said sample column for controlled communication with each open end thereof, said sealing means having a substantially rigid top member and bottom member for directly engaging and pressing into opposite surfaces of said flange adjacent to and integral with said sample column to provide a positive sealing grip with each of the opposite surfaces of the flange to allow high pressure sample extraction from sample column said bottom member enclosing a lower portion of said sample column when engaging said flange to aid in the containment of high pressures;

advancing means for controllably advancing said unitary sample holder along said receiving means to sequentially bring each of said plurality of sample columns on said unitary holder into alignment with said sealing means; and

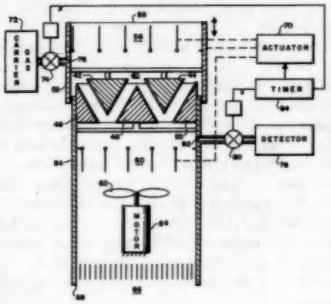
control means coupled to said sealing means and said advancing means for sequentially causing said advancing means to repetitively and sequentially (i) advance said sample holder to a next sample column, (ii) cause said sealing means to sealably engage the two opposite surfaces of the flange said of next sample column for sample extraction, and (iii) to release said next sample column in readiness for repetition of the sequence.

4,711,765

SORPTION/DESORPTION GAS ANALYSIS APPARATUS

Marion H. Cates, and Eugene L. Szonntagh, both of Largo, Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 2, 1986, Ser. No. 881,362
Int. Cl.[4] G01N *1/18, 30/02;* B01D *35/18, 53/14*
U.S. Cl. 422—89 **20 Claims**



1. A sorption/desorption analysis apparatus comprising

sorption/desorption bed means having a first tapered bed element and a second tapered bed element arranged to mate with said first bed element said first and second tapered bed elements forming a fluid flow path therebetween,

inlet passage means for directing a fluid to be analyzed to said flow path across said bed means between said first and second bed elements to produce a sorption of the fluid to be analyzed by the sorption bed means,

means for desorbing a sorbed sample from said bed means detector means for receiving and analyzing a desorbed sample from said bed means,

means for directing a flow of a desorbed sample from said bed means to said detector means,

drive means for displaying and second bed element relative to said first bed element for selectively transferring said bed means from a high flow volume condition during a sorption operation to a low flow volume condition during a desorption operation by a relative movement of said first and second bed elements to produce a volume reduction in the fluid flow path across said bed means and

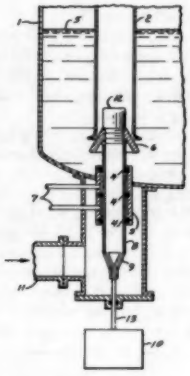
means for operating said means for desorbing, said means for directing and said drive means to transfer the apparatus between the sorption operation and the desorption operation.

4,711,766

APPARATUS FOR MIXING CRACKING CATALYST WITH A FLUID HYDROCARBON

Robert R. Cartmell, Crown Point, Ind., and Carl J. Horecky, Elmhurst, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 629,070, Jul. 9, 1984, Pat. No. 4,624,836.
This application Nov. 25, 1986, Ser. No. 934,746
Int. Cl.[4] C10G *11/18*
U.S. Cl. 422—140 **3 Claims**



1. An apparatus for immediately and intimately mixing fluidizable cracking catalyst with a fluid hydrocarbon feedstock which comprises:

(a) means defining a chamber for containing a cracking catalyst;

(b) a riser reactor situated within said chamber having an access opening defined at its upstream end for receiving the cracking catalyst and the feedstock;

(c) a plug valve having: (i) a generally upright tubular valve stem, adapted to carry the feedstock (ii) a hollow plug secured to said valve stem which is engageable in a reciprocating fashion from a closed position for blocking said access opening to an open position for permitting the flow of the cracking catalyst from said chamber through said access opening into said riser reactor to mix with the feedstock; and

(d) a nozzle means secured to said plug valve for injecting the feedstock into said riser from said plug valve.

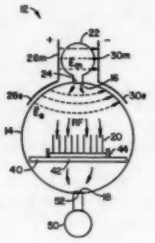
(e) a stationary guide tube positioned concentrically and externally around a portion of said tubular valve stem, said guide tube defining an upper annular compartment and a lower annular copartment said annular compartments separated by at least one bushing, said upper annular compartment bounded at its upper end by an upper bushing and said lower annular compartment bounded at its lower end by a lower bushing, each annular compartment having a bleed medium conduit connected thereto.

4,711,767

PLASMA REACTOR WITH VOLTAGE TRANSFORMER

Perry A. Diederich, Fremont, Calif., assignor to PSI Star, Fremont, Calif.

Continuation-in-part of Ser. No. 698,448, Feb. 5, 1985, Pat. No. 4,600,563. This application Apr. 30, 1986, Ser. No. 846,909
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] B01J *19/08*
U.S. Cl. 422—186.29 11 Claims



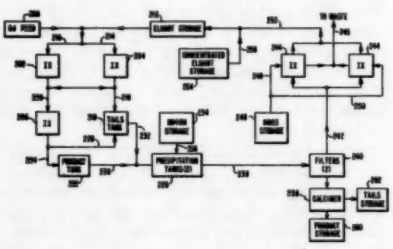
1. In a plasma reactor comprising
a working chamber, said chamber is adapted to receive at least one article and a volume of plasma which is capable of interacting with a material of said article;
a pair of electrodes positioned about said chamber; and
a radio-frequency generator,
wherein the improvement comprises a radio-frequency voltage transformer which includes a primary winding connected to the radio-frequency generator through an impedance matching network and a secondary winding, the center of which is grounded, and which secondary winding is adapted to transform the energy received from the primary winding into plasma-exciting energy at the electrodes, whereby the voltage between the energy-excited plasma and any grounded members of the plasma reactor is between 10 and 100 volts such that the intensity of any arc discharge across said voltage is minimized.

4,711,768

PROCESS FOR THE SEPARATION OF GADOLINIUM ISOTOPES

Steven H. Peterson, Murrysville; Edward J. Lahoda, Edgewood, and Sharon L. Weisberg, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 638,331, Aug. 6, 1984, abandoned. This application Jun. 18, 1985, Ser. No. 746,143
Int. Cl.[4] B01D *59/30*
U.S. Cl. 423—21.5 17 Claims



1. The process for separation of the gadolinium isotopes from a mixture of gadolinium isotopes comprising:
providing an eluant solution consisting essentially of aqueous methanol, containing 70–85 percent by volume methanol, and having a concentration of ammonium nitrate of a value of 1.0–2.0 N;
saturating a plurality of columns of a strongly basic anion exchange resin with said eluant solution;
forming a gadolinium feed solution of said mixture of isotopes;
charging said feed solution to said plurality of saturated columns;
passing additional said eluant solution through said plurality of columns containing the feed solution so as to form a first fraction of eluant solution richer in at least one of said gadolinium isotopes than a second fraction containing at least one other of said isotopes;
separating said first fraction from said second fraction after passage through said columns;
recovering the aqueous methanol and ammonium nitrate from the eluant after passage through said columns; and
recycling aqueous methanol so recovered for formation of further said eluant solution.

4,711,769

CALCIUM-PHOSPHORUS-APATITE HAVING NOVEL PROPERTIES AND PROCESS FOR PREPARING THE SAME

Senya Inoue, Kasukabe, and Akira Ono, Adachi, both of Japan, assignors to Kanto Kagaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP85/00693, § 371 Date Jul. 30, 1986, § 102(e) Date Jul. 30, 1986, PCT Pub. No. WO86/03733, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 18, 1985, Ser. No. 893,324
Claims priority, application Japan, Dec. 18, 1984, 59-265270; Mar. 1, 1985, 60-38655; Sep. 20, 1985, 60-206693; Nov. 11, 1985, 60-250925
Int. Cl.[4] C01B *15/16, 25/26*
U.S. Cl. 423—308 17 Claims

1. A process for the preparation of calcium-phosphorus-apatite comprising:
(a) admixing a solvent system with a calcium compound and a phosphorus compound soluble in said solvent system to prepare a raw material solution, said solvent system being water, or an organic solvent compatible with water or a mixture of water and an organic solvent compatible with water, and said raw material solution has an atomic ratio of Ca/P of calcium to phosphorus of 1.60 to 1.85;
(b) atomizing said raw material solution in a flame or heating zone at a temperature sufficient to effect thermal decomposition of said raw material solution; and
(c) recovering the produced calcium-phosphorus-apatite product.

4,711,770

SILICON SUBSTITUTED Y ZEOLITE COMPOSITION LZ-210

Gary W. Skeels, Brewster, and Donald W. Breck, deceased, late of New York, both of N.Y. (by Stephen R. Breck, George D. Breck, heirs), assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 700,894, Feb. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 315,853, Oct. 28, 1981, abandoned, and a continuation-in-part of Ser. No. 476,780, Mar. 18, 1983, abandoned, which is a continuation of Ser. No. 315,853, Oct. 28, 1981, Pat. No. 4,503,023, which is a continuation-in-part of Ser. No. 66,330, Aug. 14, 1979, abandoned. This application Jun. 30, 1986, Ser. No. 880,103
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 15 Claims

1. A crystalline zeolitic aluminosilicate having at least some of its original framework aluminum atoms replaced by extraneous silicon atoms and having a mole ratio of oxides in the anhydrous state of

$$(0.85\text{–}1.1)M_{2/n}O:Al_2O_3:xSiO_2$$

wherein M is a cation having a valence of "n"; "x" has a value greater than 6.0; has a X-ray powder diffraction pattern having at least the d-spacings of Table A; and has extraneous silicon atoms in the crystal lattice in the form of framework SiO_4 tetrahedra.

4,711,771

PROCESS AND APPARATUS FOR COOLING A GASEOUS STREAM BEFORE AND/OR DURING ITS COMPRESSION

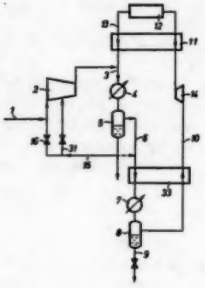
Helmut Schiller, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,301

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309322

Int. Cl.[4] C01C *1/04*

U.S. Cl. 423—359 4 Claims



1. In a process for the production of ammonia wherein said process comprises compressing a gaseous stream in a synthesis reaction process wherein inlet synthesis feed gas comprising a mixture of H_2 and N_2 is fed to a compressor to be compressed thereby, the improvement comprising said inlet synthesis feed gas being cooled prior to compression by having product liquid ammonia from the synthesis reaction mixed therewith, removing the heat of compression and separating condensed product gas from the compressed mixture to then effect the synthesis reaction and recycling a portion of the liquified ammonia synthesis reaction product as said cooling liquid to be mixed with said inlet synthesis feed gas, wherein the requirement of conducting cooling with liquid external to the process is eliminated reducing the work required to effect compression.

4,711,772

PREPARATION OF HYDROGEN PEROXIDE

Stephen E. Jacobson, Morristown, N.J., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Sep. 18, 1986, Ser. No. 909,057

Int. Cl.[4] C01B *15/02*

U.S. Cl. 423—584 31 Claims

1. A process for producing hydrogen peroxide by reacting carbon monoxide, oxygen, and water in the presence of a palladium catalyst wherein the improvement comprises carrying out said reaction in the presence of a soluble compound of Pd, an arsine ligand, a non-coordinating acid, water, and a solvent for said Pd compound and said ligand, wherein the molar ratio of CO/O_2 is in the range of 1/100 to 50/100 and the molar ratio of said arsine ligand/Pd is at least 10/1.

4,711,773

PROCESS FOR THE PRODUCTION OF HYDROGEN

Carolus M. A. M. Mesters, Utrecht; John W. Geus, Bilthoven, and Eugène G. M. Kuijpers, Apeldoorn, all of Netherlands, assignors to VEG-Gasinstituut N.V., Netherlands

Continuation of Ser. No. 899,799, Aug. 25, 1986, abandoned, which is a continuation of Ser. No. 667,125, Nov. 1, 1984, abandoned. This application Mar. 19, 1987, Ser. No. 28,001

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339865

Int. Cl.[4] C01B *2/10*

U.S. Cl. 423—655 21 Claims

1. A process for the production of hydrogen with simultaneous formation of carbon dioxide by reacting carbon monoxide with steam at elevated temperatures in the presence of catalysts containing more than 1% by weight of copper based on the total weight of the catalyst, characterized in that the catalyst consists essentially of a refractory oxidic carrier having a high specific surface area of more than 30 m^2/gram loaded with metallic copper having a high specific surface area accessible to the gas phase which amounts to at least 20 m^2/gram of the metallic copper and said copper having a purity of more than 90% by weight, a fraction of at least 1% by weight of said metallic copper, calculated as % by weight of the total weight of the copper and carrier, being present as particles of a size of less than 20 nm, said catalyst consisting of less than 15% zinc or its oxide by weight of the active metal plus carrier of the catalyst.

4,711,774

MEDICAMENT ADSORBATES WITH COMPLEX MAGNESIUM ALUMINUM SILICATE AND THEIR PREPARATION

John Denick, Jr., Newton; David Peters; Anil K. Talwar, both of Long Valley, and Wei C. Liao, Iselin, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 27, 1986, Ser. No. 845,101

Int. Cl.[4] A61K *9/68, 33/12*

U.S. Cl. 424—48 12 Claims

1. A medicament adsorbate which comprises: a complex magensium aluminum silicate having the following typical chemical analysis:

	Percent by Weight	Ratio to Aluminum Oxide
Silicon dioxide	56 to 59	14.0 to 29.5
Magnesium oxide	21 to 24	5.2 to 12.0
Aluminum oxide	2.0 to 4.0	1
Ferric oxide	0.4 to 0.6	
Calcium oxide	1.1 to 1.5	
Sodium oxide	2.5 to 3.5	
Potassium oxide	0.5 to 1.0	
Ignition Loss	5.5 to 12.6	

having sorbed therein a solution of medicament drug, wherein the medicament drug is the expectorant guaifenesin.

4,711,775

COSMETIC COMPOSITIONS

Walter Dittmar, Hofheim; Eberhard Futterer, and Gerhard Lohaus, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 478,857, Mar. 25, 1983, abandoned, which is a continuation of Ser. No. 21,948, Mar. 19, 1979, abandoned, which is a division of Ser. No. 605,210, Aug. 15, 1975, Pat. No. 4,185,106, which is a continuation of Ser. No. 377,440, Jul. 9, 1973, abandoned. This application Dec. 4, 1984, Ser. No. 677,891

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1972, 2234009

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 12 Claims

1. An anti-dandruff shampoo comprising a surfactant and, as the active anti-dandruff agent therein, from 0.2 to 10 percent of 1-hydroxy-4-methyl-6-(2,4,4-trimethylphenyl)-2-pyridone, a salt thereof, or a mixture of said pyridone with said salt.

4,711,776

HAIR COSMETIC COMPOSITION

Toshio Suzuki, Ichikawa, and Kazuyuki Yahagi, Tokyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,198

Claims priority, application Japan, Nov. 6, 1984, 59-233761

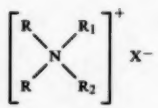
Int. Cl.[4] A61K *7/06, 7/08, 9/12*

U.S. Cl. 424—70 3 Claims

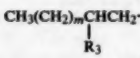
1. A hair cosmetic composition comprising:

(A) 0.01–20 wt. % of one or more of branched quaternary ammonium salts represented by the following formula (i) or (ii):

(i)

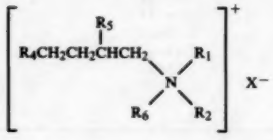


wherein R is an alkyl group selected from (a) branched alkyl groups represented by

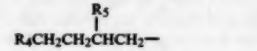


and (b) linear alkyl groups represented by $CH_3—CH_2)_n$, R_3 being a methyl or ethyl group, m=3–12 and n=7–15, the degree of branching of the group R, defined as (a)/{(a)+(b)} is 10–100 wt. %, R_1 and R_2 denote independently an organic group selected from the group consisting of a benzyl group, alkyl groups having 1–3 carbon atoms and hydroxyalkyl groups having 1–3 carbon atoms, and X^- means a halogen or organic anion,

(ii)



wherein R_4 and R_5 are independently an alkyl group having 2–12 carbon atoms, R_6 means a group



or an alkyl group having 1–3 carbon atoms, and R_1, R_2 and X^- have the same meanings as defined above; and

(B) 0.1–30 wt. % of oils and fats selected from the group consisting of a higher alcohol containing a linear or branched alkyl or alkenyl group having 12–26 carbon atoms and a fatty acid monoglyceride derived from saturated or unsaturated, linear or branched fatty acids having 12–24 carbon atoms.

4,711,777

PHARMACEUTICAL TABLETS

Hong S. Tan, Bleiswijk, and Bernardus B. M. Wegman, Hoofddorp, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Apr. 30, 1986, Ser. No. 858,013

Claims priority, application European Pat. Off., 05021985, May 2, 1985, 85200692.3

Int. Cl.[4] A61K *9/20, 31/74*

U.S. Cl. 424—79 10 Claims

1. A tablet consisting essentially of granules formed by wet granulation of (a) 80 to 98% by weight of a mixture of trimethoprim and/or an acid addition salt thereof and a sulfonamide and/or a salt thereof in a weight ratio of 1:20 to 20:1 and (b) 1 to 8% by weight of a pharmaceutically acceptable synthetic ion exchange resin.

4,711,778

INACTIVATED RABIES VACCINE FOR VETERINARY USE

Edmund P. Bass, and Richard L. Sharpee, both of Lincoln, Nebr., assignors to Norden Laboratories, Inc., Lincoln, Nebr.

Division of Ser. No. 376,905, May 10, 1982, abandoned, which is a division of Ser. No. 174,306, Jul. 30, 1980, Pat. No. 4,347,239. This application May 22, 1985, Ser. No. 736,900

Int. Cl.[4] A61K *39/12;* C12N *7/00*

U.S. Cl. 424—89 5 Claims

1. A combination vaccine capable of inducing immunity in feline animals without serious side effects comprising vaccinal amounts of inactivated HCP-SAD strain of rabies virus which has been adapted to grow, before inactivation, in swine testicle cell culture by at least one passage in said cell culture and one or more vaccinal feline viruses selected from modified feline viral rhinotracheitis virus, calicivirus and panleukopenia virus, and a carrier therefor.

4,711,779

GLYCOPROTEINIC CONJUGATES HAVING TRIVALENT IMMUNOGENIC ACTIVITY

Massimo Porro, Localita' Collanza, and Paolo Costantino, Colle Val d'Elsa, both of Italy, assignors to Sclavo S.p.A., Siena, Italy

Filed Jul. 2, 1986, Ser. No. 881,091

Claims priority, application Italy, Jul. 5, 1985, 21451 A/85

Int. Cl.[4] C07K *17/10;* A61K *39/385*

U.S. Cl. 424—92 12 Claims

1. Glycoproteinic conjugates having trivalent immunogenic activity, obtained by covalently binding a proteinic antigen selected among CRM 197, tetanus toxoid, and pertussis toxin, with at least one first oligosaccharidic hapten obtained from the capsular polysaccharide of a gram-positive bacterium, and with at least one second oligosaccharidic hapten obtained from the capsular polysaccharide of a gram-negative bacterium, said first and second oligosaccharidic haptens having been preliminarily activated by the introdution of terminal ester groups.

4,711,780

COMPOSITION AND PROCESS FOR PROMOTING EPITHELIAL REGENERATION

Mostafa S. Fahim, 500 Hulen Dr., Columbia, Mo. 65201

Continuation-in-part of Ser. No. 619,004, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 341,544, Jan. 21, 1982, abandoned. This application May 12, 1986, Ser. No. 862,051

Int. Cl.[4] A61K *33/30, 31/195*

U.S. Cl. 424—145 16 Claims

1. A medication for treating epithelial tissue comprising vitamin C, a zinc salt and a sulfur amino acid in an amount sufficient to stimulate cell proliferation and new cell formation.

4,711,781

MEDICINAL SELF-ADHESIVE PLASTER

Erich Nick, Eichhörnchenweg 2, D-2080 Pinneberg; Günter Guse, Lilicronstr. 30, D-2000 Hamburg 73, and Bodo Asmussen, Dorotheenweg 1a, D-2071 Ammerbek 2, all of Fed. Rep. of Germany

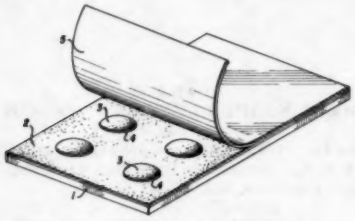
Filed Jun. 17, 1985, Ser. No. 745,170

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423293

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[4] A61L *15/03, 15/06;* A61F *13/02;* A61K *31/505*

U.S. Cl. 424—446 22 Claims



1. A self-adhesive medicinal plaster in which the medication is isolated from the adhesive, comprising:

(a) a carrier web;

(b) a continuous adhesive coating on one surface of said carrier web;

(c) a plurality of non-permeable, separating film elements spaced from each other on the surface of said adhesive coating; in a predetermined pattern; and

(d) a plurality of active ingredient elements containing at least one medication, each disposed on the surface of and within the perimeter of one of said separating film elements, said active ingredient elements each having a maximum surface dimension of about 5000 μm.

4,711,782

PROLONGED RELEASE MICROCAPSULES AND THEIR PRODUCTION

Hiroaki Okada; Yasuaki Ogawa, both of Osaka, and Takatsuka Yashiki, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 667,096, Nov. 1, 1987, Pat. No. 4,652,441. This application Dec. 11, 1986, Ser. No. 940,614

Claims priority, application Japan, Nov. 4, 1983, 58-207760

Int. Cl.[4] A61K *9/52;* B01J *13/02*

U.S. Cl. 424—455 13 Claims

1. A prolonged release microcapsule having an average diameter of about 0.5 to 400 μm for injection, which is produced by preparing a water-in-oil emulsion comprising an inner aqueous layer containing a water-soluble and non-polypeptidic drug, a drug retaining substance therefor selected from a member of the group consisting of gelatin, albumin, pectin and agar and an oil layer containing a polymer substance of lactic acid-glycolic acid copolymer or lactic acid polymer, then thickening or solidifying said inner aqueous layer to a viscosity of not lower than about 5000 centipoises and finally admixing the resulting emulsion with third aqueous layer to give a water/oil/water ternary layer emulsion and then desorbing the solvent in the oil layer.

4,711,783

FORMS OF MICROENCAPSULATION OF MEDICINAL SUBSTANCES BY HOMOGENEOUS LAYERS OF NATIVE COLLAGEN

Alain Huc, Ste Foy-les-Lyons; Rene Gimeno, Pelussin, and Daniel Herbage, Lyons, all of France, assignors to Bioetics, S.A., Lyons, France

Filed Apr. 3, 1984, Ser. No. 596,422

Int. Cl.[4] A61K *9/38, 9/64, 9/22, 9/52*

U.S. Cl. 424—460 5 Claims

1. A sustained-release, coated pharmaceutical composition, suitable for oral administration, which consists essentially of:

(a) a pharmaceutically effective amount of an orally-administered medicament in granular form; and

(b) a layer of homogeneous, native collagen coating said granules of medicament, said layer of homogeneous, native collagen applied to the granules of medicament by the following steps:

(i) forming an acid-soluble methanolic solution of native collagen having a mean molecular mass equal to or greater than 300,000 Daltons, the collagen macromolecule having a width greater than 15 angstrom units and a length greater than 2990 angstrom units, constituted by 3 peptide chains wound around each other in a common helical axis, each having a molecular mass of 10,000 Daltons wherein every third amino acid residue is a glycine residue and having a high number of hydroxy-proline residues, between each of said peptide chains there exist covalent chemical bonds which are bonded on at least one side to the end of a peptide chain called a telopeptide, said telopeptide not present in the common helical axis and having a length of about 50 angstrom units, thereby providing a collagen that is partially insoluble and resistent to enzymes;

(ii) applying the methanolic solution of native collagen formed in step (a) to the orally-administered medicament in granular form to cover the granular medicament with a homogeneous layer of native collagen;

(iii) air-drying the coating on said granular medicament to a homogeneous layer of native collagen; and

(iv) subjecting the granular medicament coated during step (c) and after air-drying to a thermal treatment under vacuum at 100° C. for 24 hours, to assure reticulation of the collagen.

4,711,784

ENCAPSULATION COMPOSITION FOR USE WITH CHEWING GUM AND EDIBLE PRODUCTS

Robert K. Yang, Randolph, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 7, 1986, Ser. No. 816,769

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—5 19 Claims

1. A chewing gum composition containing a sweetener encapculated in a solvent-free encapsulation composition, wherein the encapsulation composition comprises a blend of high molecular weight polyvinyl acetate having a molecular weight of about 20,000 to about 100,000 MWU and a hydrophobic plasticizer, said polyvinyl acetate and hydrophobic plasticizer being present in a ratio of about 5:1 to about 1:5, and wherein said blend is capable of forming an encapsulating film.

4,711,785

PROCESS OF VINIFICATION

Guy Bruch, 48 rue Rosa Bonheur, 33000 Bordeaux, France

Division of Ser. No. 471,466, Mar. 2, 1983, Pat. No. 4,593,611.
This application Dec. 5, 1985, Ser. No. 794,229
Claims priority, application France, Mar. 12, 1982, 82 04564; Feb. 18, 1983, 83 02664
Int. Cl.[4] C12G *1/02*
U.S. Cl. 426—15 5 Claims

1. A vinification process for the manufacture of wine or wine products through fermentation in a vat, said process comprising the steps of:

(a) introducing in the vat a must obtained by pressing fruits, said must comprising a liquid phase having an upper level and a lower level and a solid component said solid component constituting a cap occupying the upper level of the liquid phase;

(b) extracting at least a portion of liquid phase during the fermentation;

(c) thermally treating said extracted liquid phase by exchanging selectively thermal energy with respect to the extracted liquid phase;

(d) after thermal treatment, reinserting the thermally treated extracted liquid phase at a selected point with respect to the liquid phase in the vat;

(e) measuring the temperature of the liquid phase at selected points in said vat; and

(f) controlling the thermal exchange with the extracted liquid phase over a period of time as a function of the measured temperatures of the liquid phase to create a desired temperature gradient of the liquid phase in the vat and a desired temperature evolution as a function of time, whereby a wine of desired quality is produced.

4,711,786

HIGH FIBER BREAD AND EXTRUDED PRODUCTS

Edward D. Schmidt, Minneapolis, Minn., assignor to E.D.S. Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 486,357, Apr. 19, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 756,400
Int. Cl.[4] A21D *2/00, 8/02*
U.S. Cl. 426—19 28 Claims

1. A composition for making high fiber content edible products, comprising 100 parts by weight of a cereal grain flour and a premix that includes about 5 to 32 parts by weight of pea hull fibers and triticale hull fibers with the ratio of pea hull fibers to triticale fibers being in the range of about $\frac{1}{4}$ to 6/1.

4,711,787

LIVESTOCK FEED AND MANUFACTURING METHOD THEREOF

Keikichi Ōdaira, Tokyo, Japan, assignor to Yojigen Agricultural Corporation, Tokyo, Japan

Continuation of Ser. No. 632,529, Jul. 19, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 836,220
Claims priority, application Japan, Aug. 4, 1983, 58-142827
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—31 11 Claims

1. A method of manufacturing a livestock feed which consists essentially of the steps of

mixing okara with cereal husks to form a mixture containing from 10 to 20% by weight lignin as measured on the dry basis, and 60 to 70% water

sterilizing the mixture to provide a medium for the growth of edible white-rotting fungi; and

adding edible white-rotting fungi which have a substantial mycorrhiza-forming function selected from the group consisting of agaric (*Pleurotus ostreatus*), *Lentinus edoes* (*Cortinellus shiitake*) and *Lyopyllum aggregatum* to said mixture and cultivating said fungi to convert said mixture containing okara which is not useful as a livestock feed into a valuable liverstock feed.

4,711,788

COOKIE FILLER COMPOSITIONS

Sam J. Porcello, Toms River; James M. Manns, Glenwood, both of N.J.; Kenneth W. Player, Dublin, and Lonny L. Wilson, Brunswick, both of Ohio, assignors to Nabisco Brands, Parsippany, N.J.

Filed Sep. 17, 1984, Ser. No. 651,088
Int. Cl.[4] A23D *5/00;* A23G *3/00*
U.S. Cl. 426—94 7 Claims

1. A filler cream having complete melting and rapid get away properties at body temperature, comprising:

(a) an oleaginous composition containing a plurality of oils, said oils being selected from the group consisting of palm kernel oil, cotton seed oil, and soybean oil, said oleaginous composition having a solid fat index wherein there is:

(i) 39 percent solid at 50° F.;

(ii) 17 percent solid at 70° F.;

(iii) 7 percent solid at 80° F.;

(iv) 1 percent solid at 92° F.;

(v) 0 percent solid at 104° F.; and

(b) a sugar mixed into the oleaginous composition, the filler cream having a specific gravity of between about 0.70 and about 0.82.

4,711,789

PROLONGING THE SHELF LIFE OF PRE-CUT FRESH CELERY

Avigdor Orr, Highland Park, and John O. Spingler, Plainsboro, both of N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Filed Oct. 29, 1985, Ser. No. 792,338
Int. Cl.[4] A23B *7/14, 7/148;* A23L *1/212;* B65B *31/00*
U.S. Cl. 426—326 6 Claims

1. A process to maintain in a viable form a fresh vegetable having enlarged petioles as a predominant feature which comprises:

(a) selecting a petiole of a vegetable having enlarged petioles as a predominant feature, said petiole having chemical and physiological properties characteristic of the petioles of the vegetable in its market mature state which provide acceptable shelf life, the chemical properties including protein of about 0.98% by weight and above and ash of less than about 0.85% by weight, and the physiological properties including tissue cells having a size of about 9 to about 12 cells per mm and a lack of pithiness in the cut surface of the petiole,

(b) cutting said selected petiole into pieces in a manner effective to minimize bruising throughout the out piece and damaging of tissue in the vicinity of the cut surfaces,

(c) contacting said petiole pieces with water at about 1° C. to about ambient temperature for about 2 to about 5 minutes,

(d) removing surface water from said petiole pieces, and

(e) packaging said petiole pieces in a sealed container effective to prevent microbial recontamination of said petiole pieces, said container having a gas permeability and a ratio of the mass of said petiole pieces to the container surface effective to maintain said petiole pieces in a viable condition, the gas permeability being about 50 to about 300 cc of O_2/100 in^2- atm. - 24 hrs., about 200 to about 800 cc of CO_2/100 in^2- atm. - 24 hrs., and a moisture transmission rate of less than about 1.5 g/100 in^2- 24 hrs. - 90% R.H., 70° F. and the ratio of the mass of said petiole pieces to the container surface being about 1 to about 6 g/in^2.

4,711,790

OPTICAL CVD METHOD WITH A STRONG OPTICAL INTENSITY USED DURING AN INITIAL PERIOD AND DEVICE THEREFOR

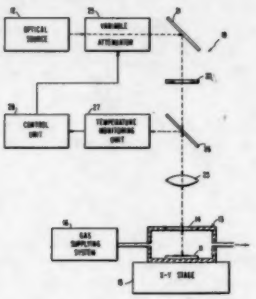
Yukio Morishige, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,125

Claims priority, application Japan, Jul. 17, 1985, 60-155962; Jul. 17, 1985, 60-155963; Mar. 7, 1986, 61-49616

Int. Cl.[4] B05D 3/06

U.S. Cl. 427—10 9 Claims



1. A method of depositing a thin film on a predetermined area of a substrate exposed to a gas susceptible of photochemical reaction, said method including the step of irradiating said area by a pulsed optical beam of an optical intensity, wherein the improvement comprises the step of controlling said intensity during deposition of said film to a range determined by a thickness to which said film is deposited.

4,711,791

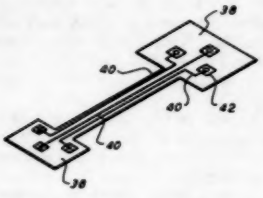
METHOD OF MAKING A FLEXIBLE MICROCIRCUIT

Charles D. Wiseman, Cottage Grove, and William M. Theisen, Madison, both of Wis., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Aug. 4, 1986, Ser. No. 892,514

Int. Cl.[4] B05D 5/12

U.S. Cl. 427—96 5 Claims



1. A method of making a flexible microcircuit having a plurality of holes for electrical connections and having conductive runs joining the holes comprising the steps of:

a. coating base polyimide material on to a substrate,

b. creating a photoresist mask surface on the base polyimide in all area's except where conductive runs are desired,

c. coating aluminum over the entire polyimide surface,

d. removing the photoresist mask surface to remove the aluminum coating in all areas but the desired aluminum runs on the polyimide surface,

e. coating the entire polyimide surface and aluminum runs with chromium,

f. creating a photoresist mask surface of predetermined shape on the chromium surface outlining the desired form of the flexible microcircuit and desired holes in the aluminum runs,

g. removing the chromium in the areas outlining the microcircuit and at the desired holes to be formed in the aluminum runs, thereby exposing a portion of the aluminum runs in the shape of the desired holes,

h. removing the exposed aluminum in the shape of the desired holes, thereby exposing the polyimide material in the shape of the desired holes,

i. removing the exposed polyimide to create the desired holes through the polyimide,

j. removing the chrome surface to thus remove the polyimide microcircuit from the substrate.

4,711,792

ELASTOMER-COATED BIAS REINFORCEMENT FABRIC AND METHOD FOR PRODUCING SAME

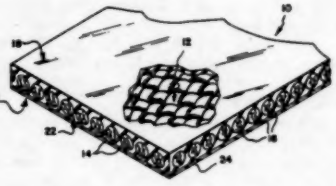
Delmar D. Long, Rock Hill, S.C., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 787,830, Oct. 15, 1985, Pat. No. 4,637,940, which is a division of Ser. No. 652,394, Sep. 20, 1984, Pat. No. 4,565,715, which is a division of Ser. No. 533,098, Sep. 16, 1983, Pat. No. 4,490,428, which is a continuation-in-part of Ser. No. 350,969, Feb. 22, 1982, Pat. No. 4,501,771. This application Aug. 1, 1986, Ser. No. 892,517

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.[4] B05D 3/12

U.S. Cl. 427—176 1 Claim



1. In a method for manufacturing elastomer-coated, fabric means comprising:

a. transversely stretching a fabric means,

b. applying an elastomeric latex composition to said fabric means while said fabric means is maintained transversely stretched, such that said composition substantially penetrates said fabric means and provides an elastomeric coating of substantially uniform thickness, and

c. drying said coated latex composition, the improvement which comprises:

prior to stretching said fabric means, pre-impregnating said fabric means with a liquid non-elastomeric composition which facilitates the impregnation of said fabric means by an elastomer but does not stabilize the orientation of said fabric means, said liquid non-elastomeric composition comprising water and an impregnation facilitating agent disposed in said water.

4,711,793

PROCESS FOR CHARGE MODIFYING A MICROPHOROUS MEMBRANE

Eugene A. Ostreicher, Farmington; Rodney A. Knight, New Milford; Joseph V. Fiore, Fairfield; George T. Emond, Southington, all of Conn., and Kenneth C. Hou, San Antonio, Tex., assignors to Cuno Incorporated, Meriden, Conn.

Division of Ser. No. 314,307, Oct. 23, 1981, Pat. No. 4,473,474, which is a continuation-in-part of Ser. No. 201,366, Oct. 27, 1980, abandoned. This application Sep. 18, 1984, Ser. No. 651,749

Int. Cl.[4] B05D *5/00*

U.S. Cl. 427—244 45 Claims

1. A process for cationically charge modifying a skinless hydrophilic organic polymeric microporous filter membrane having an internal microstructure throughout said membrane comprising bonding a charge modifying amount of a primary cationic charge modifying agent to substantially all of the membrane microstructure without substantial pore size reduction or pore blockage, the primary charge modifying agent being a water soluble organic polymer having a molecular weight greater than about 1000, wherein each monomer thereof has at least one epoxide group capable of bonding to the surface of the membrane and at least one tertiary amine or quaternary ammonium group.

4,711,794

AMYLACEOUS COMPOSITION FOR MIXTURES BASED ON SYNTHETIC OR NATURAL BINDERS EMPLOYED IN THE MANUFACTURE OF CERTIAN TEXTILE OR PARATEXTILE PRODUCTS, PARTICULARLY OF THE COMPOSITE TEXTILE OR FABRIC TYPE

Serge Gosset, Lestrem, and Jean-Claude Lumaret, Bethune, both of France, assignors to Roquette Freres Société Anonyme, Lestrem, France

Filed May 10, 1985, Ser. No. 732,570

Claims priority, application France, May 17, 1984, 84 07668

Int. Cl.[4] B05D *3/02;* C08L *3/00*

U.S. Cl. 427—389.9 10 Claims

1. In a process for the preparation of textile or paratextile products, particularly of the composite textile or fabric type, comprising successively selecting of a mixture based on synthetic or natural bonding agents or compounds, applying the said mixture to a constituent part of the textile to be prepared, drying and conditioning of the finished product, the improvement according to which the mixture based on synthetic or natural bonding agents or compounds as selected is characterized by the fact that a proportion of about 5% to about 30% by weight of the dry bonding agents is replaced by an equivalent amount of a composition comprising:

from 7% to 45% by weight of a starch swelling in cold water, obtained by one of the treatments comprising physical and chemical modification, the physical modification being selected from drum gelatinization type treatment and cooking-extrusion and the chemical modification being selected from esterification and etherification,

from 55% to 93% by weight of granular starch, modified chemically,

from 0.2% to 4% by weight, expressed in OH^- equivalents with respect to the total starch of the composition, of at least one alkaline agent adapted to lower the gelatinization temperature of the granular starch.

4,711,795

METHOD OF MANUFACTURING AN AMORPHOUS-METAL-COATED STRUCTURE

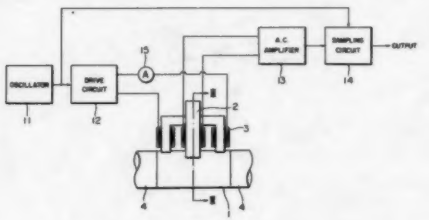
Yukihisa Takeuchi, Aicha, and Makoto Takagi, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 711,486, Mar. 13, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 910,269

Claims priority, application Japan, Mar. 14, 1984, 59-49975

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—130 9 Claims



1. A method of manufacturing an amorphous-metal-coated structure having a columnar base portion and an amorphous metal coating layer provided on the base portion, said method comprising the steps of:

providing the base portion of 100 to 300 in Vickers hardness made of a crystalline alloy selected from the group consisting of a Fe-based alloy and a Ni-based alloy;

providing an amorphous metal powder for the coating layer, having a particle size of 0.01 to 200 μm;

providing a cylindrical container made of a metal; placing the columnar base portion at the center of the cylindrical container; filling a space defined between the cylindrical container and the columnar base with amorphous metal powder; and

applying a pressure of 0.7 to 80 GPa on the powder from outer circumference of the container by use of a high energy rate working treatment so that the coating layer is formed and is firmly bonded to the surface of the base portion.

4,711,796

POLY(ARYLENE SULFIDE) COATING COMPOSITIONS

Michael C. Yu, and Roy F. Wright, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 696,962, Jan. 31, 1985, abandoned. This application Jun. 30, 1986, Ser. No. 880,267

Int. Cl.[4] B05D *1/24, 3/02;* C08G *75/14*

U.S. Cl. 427—185 58 Claims

37. A method for coating a substrate which comprises:

(a) contacting in a reaction mixture about 75 to about 99 mole percent of a para-dihaloaromatic compound, about 1 to about 25 mole percent, based on total moles of aromatic compounds, of an aromatic compound selected from the group consisting of ortho- and meta-dihaloaromatic compounds, a sulfur compound, a base, and a polar organic compound, under polymerization conditions thereby producing poly(arylene sulfide), wherein said base is present in a molar excess, with respect to moles of sulfur, of at least about 10 percent;

(b) recovering solid poly(arylene sulfide);

(c) preparing from the recovered solid poly(arylene sulfide) a coating composition comprising the recovered solid poly(arylene sulfide) in finely-divided form;

(d) applying to a substrate the coating composition of said step (c); and

(e) heating the thus-applied coating composition at a temperature of at least about 250° C. in an oxygen-containing atmosphere for a time effective for curing the poly(arylene sulfide) to produce a cured coating on said substrate.

4,711,797
MATERIAL FOR PACKING CONTAINERS

Jörgen Niske, Lund, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

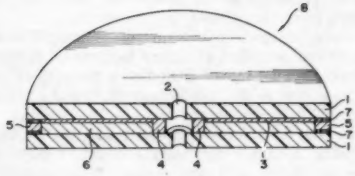
Filed Oct. 29, 1985, Ser. No. 793,329
Claims priority, application Sweden, Nov. 5, 1984, 8405539
Int. Cl.[4] B32B *3/04;* B31C *11/02*
U.S. Cl. 428—35 14 Claims

1. A material web for packing containers comprising a carrier layer of paper material and outer and inner coatings of thermoplastic material at opposite sides of said carrier layer, said material web being provided with a pattern of crease lines, said carrier layer including abraded regions each having a reduced thickness relative to other regions of said carrier layer, said abraded regions each further having a rear edge which is tapered in a direction of grinding.

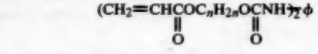
4,711,798
OPTICAL INFORMATION RECORDING MEDIUM

Yutaka Ueda, Yokohama, and Tetsu Yamamuro, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,380
Claims priority, application Japan, Dec. 16, 1985, 60-281172
Int. Cl.[4] B32B *7/12*
U.S. Cl. 428—65 6 Claims

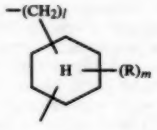


1. An optical information recording medium comprising a pair of substrates, with a recording layer comprising an organic dye being formed on one side of at least one substrate, fixed to each other through or without through a spacer and by an adhesive agent, in such a manner that said recording layer comes between said substrates, said adhesive agent comprising a compound of formula (I),

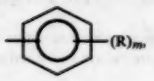


(I)

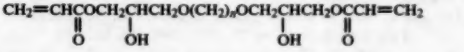
wherein ϕ represents



(l=0 or 1) or



in which R represents a methyl group or an ethyl group, m is an integer of 1 to 4, and n is an integer of 2 to 4; and a compound of formula (II),



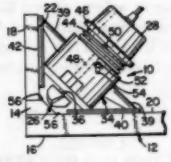
(II)

wherein n is an integer of 4 to 8.

4,711,799
APPARATUS AND METHOD FOR MAKING A COUNTER TOP AND PRODUCT OF SAME

Gene G. Gove, Box 636, 1237 W. 13th, Hastings, Minn. 55033

Continuation of Ser. No. 560,318, Dec. 12, 1983, Pat. No. 4,608,291. This application Jun. 2, 1986, Ser. No. 869,673
Int. Cl.[4] B05D *5/12*
U.S. Cl. 428—119 1 Claim



1. A method for making a counter top comprising the steps of:

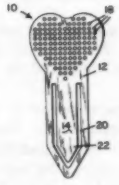
fastening a connecting slab between horizontal and vertical orthogonal slabs, said horizontal slab having a flat top surface and said vertical slab having a flat front surface; and

sliding a rotating shaping tool across said connecting slab to arcuately shape said connecting slab to tangentially meet the flat top surface and the flat front surface of said horizontal and vertical slabs.

4,711,800
NEEDLECRAFT WITH METALLIC SUBSTRATE

Maureen DiVincenzo, 1003 Wachusett St., Holden, Mass. 01520

Filed Jun. 6, 1985, Ser. No. 741,755
Int. Cl.[4] B32B *3/10;* C23F *1/02;* B44C *1/22*
U.S. Cl. 428—131 23 Claims



10. Craft item comprising:

(a) a metallic substrate having a predetermined size and shape, said having a top surface and a bottom surface, said substrate having a plurality of apertures which extend

through the substrate from said top surface to said bottom surface said appertures being arranged in a predetermined pattern, and

(b) at least one thread which is stitched through said apertures to form a predetermined needlecraft pattern on said top surface.

4,711,801

METHOD AND MACHINE FOR CONVOLUTE OR SPIRAL WINDING OF COMPOSITE MATERIALS

Leo Kadunce, Morrisville, Pa., assignor to Steeltin Can Corporation, Baltimore, Md.

Division of Ser. No. 663,211, Oct. 22, 1984, Pat. No. 4,629,529. This application Nov. 29, 1985, Ser. No. 802,740

Int. Cl.[4] C09J *7/02;* **B32B** *15/08, 27/10*

U.S. Cl. 428—192 **7 Claims**

1. A composite blank for use in forming a cylindrically shaped body, for subsequent use as a container comprising a paper board forming a core for the blank, a heat activatable adhesive coating on at least portions of both sides of the board and adapted to provide an adhesive upon heating the blank, an aluminum foil sheet covering slightly more than half of the said coating on one side of the board and extending around a leading edge of the board, and a sealing coating applied to said aluminum foil sheet.

4,711,802

AQUEOUS INK FOR USE ON FLUOROCARBON SURFACES

Harvey P. Tannenbaum, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 14, 1986, Ser. No. 896,192

Int. Cl.[4] B32B *5/16, 27/08*

U.S. Cl. 428—207 **2 Claims**

1. An aqueous ink having a viscosity of from 3,000 to 8,000 centapoises containing from 1.5 to 4.0 parts of an acrylic copolymer thixotropic agent, from 2.0 to 3.0 parts of finely divided fluorocarbon resin particles, from 1.3 to 3.3 parts of a non-ionic surfactant, from 4.0 to 5.0 parts of an alcohol containing 7 to 12 carbon atoms, from 10 to 15 parts of ethylene glycol, up to 10 parts of an inert colorant and about 20 to about 50 parts of water.

4,711,803

MEGOHM RESISTOR PAINT AND RESISTORS MADE THEREFROM

Charles C. Y. Kuo, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Continuation-in-part of Ser. No. 750,029, Jul. 1, 1985. This application Aug. 22, 1985, Ser. No. 768,058

Int. Cl.[4] H01B *1/06;* **H01C** *7/10;* **B32B** *17/06*

U.S. Cl. 428—209 **14 Claims**

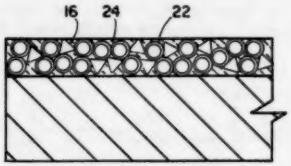
1. A base metal, resistive composition, which comprises:

a base metal powder coated with a resinate solution selected from at least one of a manganese resinate solution and a tantalum resinate solution, the resinate coated powder prefired in air, then reduced in a reducing atmosphere to form a pre-reacted powder therefrom;

a glass frit;

a screening agent; and

two to twelve percent of an oxide of hafnium, well mixed with the pre-reacted powder, the glass frit and the screening agent to form the composition having a sheet resistivity selected from a range of 500,000 ohms to five megohms



per square, when screened upon a substrate and fired in an inert atmosphere to form a base metal resistor therefrom.

4,711,804

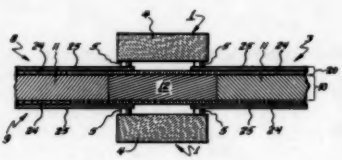
CIRCUIT BOARD CONSTRUCTION

James F. Burgess, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 2, 1986, Ser. No. 881,543

Int. Cl.[4] B32B *3/00;* **H02B** *1/00;* **H01B** *7/34;* **H05K** *3/34*

U.S. Cl. 428—210 **12 Claims**



1. An integrated circuit board assembly comprising:

a leadless integrated circuit chip carrier;

a plurality of conductive terminals associated with said carrier and extending along one face of said carrier;

a printed circuit laminate including a plurality of contact strips, said strips electrically coupled to said terminals via electrical connections; and

an inner core on which said laminate is supported, said core including a highly thermally conductive plate having openings therein, said openings located juxtaposed to said one face of said chip carrier and containing inserts having a thermal coefficient of expansion closely matching that of said carrier.

4,711,805

PROCESS FOR TREATING THE SURFACE OF A TRANSPARENT SHEET OR FILM HAVING ANTILACERATION AND SELF-HEALING PROPERTIES AND THE PRODUCT MADE THEREBY

Rädisch Helmer, Aachen, and Esser Günther, Herzogenrath, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed Jun. 25, 1984, Ser. No. 624,284

Claims priority, application France, Jul. 4, 1983, 83 11056

Int. Cl.[4] B32B *5/16, 17/10, 27/40;* **B05D** *5/06*

U.S. Cl. 428—323 **12 Claims**

1. A process for the treatment of the thermosetting polyurethane surface of a transparent sheet or film having antilacerative and self-healing properties, wherein said sheet or film comprises a thermosetting polyurethane material obtained by the reaction of a polyether polyol having free OH groups in the amount of 10.5 to 12 wt. % with a biuret of 1,6-hexanediisocyanate, wherein said polyether polyol is prepared by the reaction of epoxypropane with 1,5-dihydroxy-3-hydroxymethylpentane, and wherein said diisocyanate contains about 21 to 25 wt.

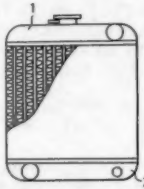
% of isocyanate groups, and further wherein the ratio of the polyether polyol component to the diisocyanate component in the reaction mixture is 0.9 to 1.1 by weight said sheet or film with the polyurethane surface exposed being employed as an external layer on a laminated glass or laminated plastic sheet, which process comprises depositing a solution, dispersion or emulsion of wax or a wax-like substance and a silicone oil; or a solution, dispersion or emulsion of wax or a wax-like substance, a silicone oil and a fine-grained polishing agent on the polyurethane surface to be treated wherein said solutions, dispersions or emulsions of wax comprise a solvent or solvents for said wax or wax-like substances which boil within the range of 40° to 300° C., and wherein said solutions, dispersions or emulsions have silicone oil in an amount of less than 4% by wt. when no polishing agents are present and in an amount of from about 2 to about 10% by wt. when said solutions, dispersions or emulsions contain said fine-grained polishing agents, and allowing the deposited solution, dispersion or emulsion to dry.

12. A transparent sheet or film which has been treated by the process according to claim 1.

4,711,806
PLASTIC PART RESISTANT TO DEICING SALT

Hiroyuki Wakabayashi, Kariya, and Tamotsu Matsubara, Chiryu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 622,556, Jun. 20, 1984, Pat. No. 4,582,763. This application Nov. 20, 1985, Ser. No. 799,863
Claims priority, application Japan, Jun. 27, 1983, 58-115608
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—334 3 Claims



1. A plastic part resistant to deicing salts,

(i) having one side in contact with water or a moist atmosphere and the other side in contact with ambient air and, in use is subjected to repeated heating to a temperature higher than 60° C., or

(ii) having a thickness greater than 1.0 mm and, in use, is subjected to repeated heating to a temperature higher than 60° C.,

wherein said plastic part is composed of a resin selected from the group consisting of a polyamide resin, which has a saturation water absorbability less than 6.0%, and a mixture composed mainly of a polyamide resin and having a saturation water absorbability less than 6.0%,

wherein said mixture is composed of 6-nylon, 6,6-nylon or a mixture thereof and at least 30 wt. % of resin which is mutually soluble with said 6-nylon or 6,6-nylon, the resin selected from the group consisting of

a polyamide resin (i) which is produced by polycondensation of a diamine containing at least 6 carbon atoms and a dicarboxylic acid containing at least 7 carbon atoms,

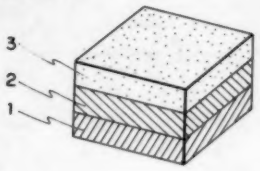
a polyamide resin (ii) which is produced by polycondensation of an amino acid containing at least 7 carbon atoms, and

a polyamide resin (iii) which is produced by ring-opening polymerization of a lactam containing at least 7 carbon atoms, an olefinic ionomer (in and mixture thereof.

4,711,807
INSULATING MATERIAL OF NON-SINGLE CRYSTALLINE SILICON COMPOUND

Kenji Yamamoto; Takehisa Nakayama, and Yoshihisa Tawada, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1985, Ser. No. 802,101
Claims priority, application Japan, Nov. 28, 1984, 59-250869
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—334 8 Claims

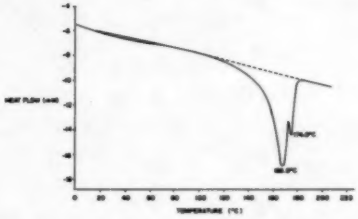


1. An insulating material comprising a non-single crystalline silicon compound having an argon content greater than or equal to 0.01 and less than or equal to 10 atomic %, and having a breakdown voltage of not less than 50 V/μm.

4,711,808
BETA PHASE PVF_2 FILM FORMED BY CASTING IT ONTO A SPECIALLY PREPARED INSULATING SUPPORT

Michael A. Marcus, Honeoye Falls, and John E. Benson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1986, Ser. No. 830,803
Int. Cl.[4] B32B *27/08*; B05D *3/06*
U.S. Cl. 428—336 3 Claims



1. A film of unstretched, unpoled polyvinylidene fluoride having the following properties:

(a) a thickness no greater than about 10 μm,

(b) a crystalline structure which is predominantly beta phase and,

(c) a subsurface structure that contains less weight % of fluorine atoms than is the case for PVF_2 which itself has been subjected to D. C. corona discharge treatment.

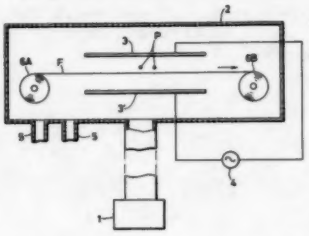
4,711,809
MAGNETIC RECORDING MEDIUM

Yasuo Nishikawa; Tsutomu Okita; Yoshito Mukaida, all of Kanagawa; Masahiro Niinomi, Tokyo; Kenji Yanagihara, Tokyo, and Mituo Kimura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 25, 1984, Ser. No. 654,286
Claims priority, application Japan, Sep. 26, 1983, 58-176388; Sep. 26, 1983, 58-176389
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—336 5 Claims

1. A magnetic recording medium comprising a support having provided thereon a thin magnetic metal film, and a

plasma polymerized layer provided on the thin magnetic film, wherein said plasma polymerized layer is formed in a monomer gas or in a gas containing the monomer gas, wherein the monomer gas or in a gas containing the monomer gas, wherein the monomer gas is at least one of 1,1-difluoroethylene, trifluoro-



ethylene, 1,1-difluorochloroethylene, and hexafluorobutadiene, wherein said plasma polymerized layer is formed at a pressure of 10^{-3} Torr to 1 Torr, wherein the thickness of the plasma polymerized layer is from 2 nm to 100 nm, and wherein the plasma polymerized layer is homogeneous in nature.

4,711,810

MAGNETIC MEDIUM FOR HORIZONTAL MAGNETIZATION RECORDING AND METHOD FOR MAKING SAME

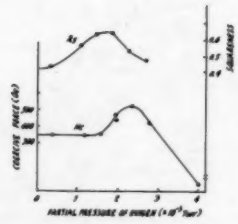
Toshio Ando, Fujisawa; Toshikazu Nishihara, Zama, and Akihiro Kimura, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Oct. 28, 1985, Ser. No. 792,046

Claims priority, application Japan, Oct. 29, 1984, 59-225830; Nov. 12, 1984, 59-236598

Int. Cl.[4] G11B *5/64*; H01F *10/00*

U.S. Cl. 428—336 **3 Claims**



1. A magnetic medium for horizontal magnetization recording which comprises a non-magnetic substrate and a magnetic recording film formed on at least one side of the substrate, said magnetic recording film consisting essentially of an amorphous Co-Cr alloy containing from 5 to 15 atomic percent of oxygen atoms, and the predominant magnetic anistropy of the magnetic recording film being a shape magnetic anistropy along an in-plane direction of the magnetic recording film.

4,711,811

THIN WALL COVER ON FOAMED INSULATION ON WIRE

Stuart K. Randa, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 22, 1986, Ser. No. 924,301

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—383 **5 Claims**

1. A wire substantially covered with a fluoropolymer foam made of a melt-processible perfluorinated copolymer of tetrafluoroethylene and an unfoamed skin around the foam comprising ethylene/chlorotrifluoroethylene copolymer or ethylene/tetrafluoroethylene copolymer.

4,711,812

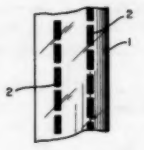
DELUSTERED NYLON FIBER CONTAINING SEGMENTED STRIATIONS OF POLYPROPYLENE

John T. Burns, Seaford, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 683,242, Dec. 18, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 800,041

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—401 **4 Claims**



1. Delustered nylon filaments containing from about 0.1 to 5% by weight of polypropylene having a melting point above 120° C., molecular weight of 2,000–40,000, and viscosity of 200–10,000 cp at 190° C., said polypropylene being present in generally cylindrical segmented striations, each striation having a uniform diameter throughout its length, an L/D ratio of from 1 to 10 and running generally parallel to the fiber axis.

4,711,813

POLYETHYLENE COMPOSITES CONTAINING A PHASE CHANGE MATERIAL HAVING A C14 STRAIGHT CHAIN HYDROCARBON

Ival O. Salyer, Dayton, Ohio, assignor to University of Dayton, Dayton, Ohio

Filed Nov. 22, 1985, Ser. No. 801,127

Int. Cl.[4] C08K *5/01, 9/12*; C09K *5/06, 3/18*

U.S. Cl. 428—402 **36 Claims**

1. A composite useful in thermal energy storage, said composite being formed of a polyethylene matrix containing at least about 10% by weight of a straight chain alkyl hydrocarbon phase change material having at least 14 carbon atoms incorporated therein, said polyethylene being crosslinked to such a degree that said polyethylene matrix is capable of absorbing at least 10% by weight of said straight chain alkyl hydrocarbon phase change material.

4,711,814

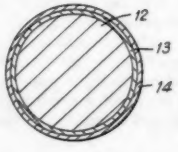
NICKEL PARTICLE PLATING SYSTEM

Robert J. Teichmann, 152 Bell St., Belleville, N.J. 07109

Filed Jun. 19, 1986, Ser. No. 875,964

Int. Cl.[4] B05D *5/12, 7/00*; B32B *5/16*; H01B *1/02*

U.S. Cl. 428—403 **9 Claims**



1. A particulate material for an electroconductive body, the material comprising, in combination:

a multiplicity of nickel particles of a size, on average, of from 1 to 300 microns in maximum dimension;

a silver coating on each of the nickel particles, the silver coating having a maximum thickness of about 10 percent of the maximum particle dimension and being about 4 percent to about 60 percent by weight of the particle; and

a gold coating surrounding the silver coating on each of said nickel particles, the gold coating on each particle having a maximum thickness of about 5 percent of the maximum particle dimension and being about 1 percent to about 15 percent by weight of the particle.

4,711,815

RECORDING MEDIUM

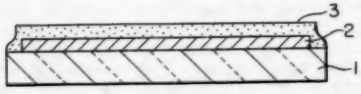
Nobuyuki Yoshiike, Ikoma, and Shigeo Kondo, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 3, 1986, Ser. No. 835,787

Claims priority, application Japan, Mar. 7, 1985, 60-45414; Mar. 12, 1985, 60-49022; Mar. 15, 1985, 60-53110; Mar. 15, 1985, 60-53116; Mar. 15, 1985, 60-53117

Int. Cl.⁴ B32B *9/04;* **G01D** *15/10, 9/00, 15/24*

U.S. Cl. 428—411.1 **10 Claims**



1. A recording medium characterized in that a coloring layer comprising a transition metal oxide is deposited on a substrate, and the said color developing layer or an upper layer adjacent to the said coloring layer contains a proton donor.

4,711,816

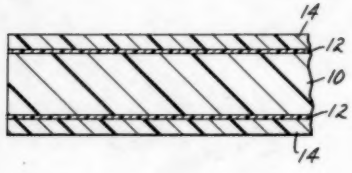
TRANSPARENT SHEET MATERIAL FOR ELECTROSTATIC COPIERS

Bruce W. Wittnebel, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1986, Ser. No. 846,274

Int. Cl.⁴ B32B *27/36*

U.S. Cl. 428—412 **11 Claims**



1. Transparent sheet material comprising:

(a) a flexible, transparent, heat resistant, polymeric film sheet base,

(b) a layer of electrically conductive prime coat coated upon at least one major surface of said film sheet base, said prime coat having a surface resistivity below 1×10^{13} ohms/square, and

(c) an electrically conductive image receiving layer coated upon the surface of said prime coat layer, said image receiving layer having a surface resistively from about 1.7×10^{10} to about 7×10^{12} ohms/square.

4,711,817

CARBOXYLIC ACID-GRAFTED PHENOXY RESINS

George A. Salensky, Hunterdon County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 725,535, Apr. 22, 1985, Pat. No. 4,638,038. This application Oct. 2, 1986, Ser. No. 914,795

Int. Cl.⁴ G03G *5/87;* **G11B** *5/70*

U.S. Cl. 428—418 **4 Claims**

1. A phenoxy coating composition comprising:

(a) a phenoxy resin having pendant secondary hydroxyl groups of which about 3 to about 50% of such hydroxyl groups have been reacted to produce moieties having pendant carboxyl groups, and

(b) a carrier for said phenoxy resin, said coating composition when coated onto steel, having improved adhesion to the steel under high humidity conditions as compared to said phenoxy resin not so reacted.

4,711,818

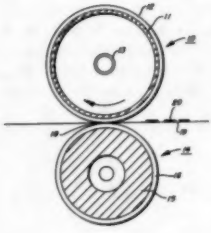
FUSING MEMBER FOR ELECTROSTATOGRAPHIC REPRODUCING APPARATUS

Arnold W. Henry, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1986, Ser. No. 866,666

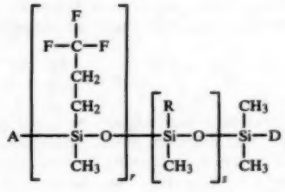
Int. Cl.⁴ B32B *27/00, 9/04, 15/04*

U.S. Cl. 428—421 **22 Claims**



1. A thermally conductive dry release fuser member for use in an electrostatographic reproducing machine without the application of a release agent comprising a base support member and a thin deformable layer of a composition coated thereon, said composition comprising the crosslinked product of a mixture of about;

(a) 100 parts by weight of at least one liquid addition curable vinyl terminated or vinyl pendant polyfluoroorganosiloxane having the formula:



where A and D are methyl or vinyl, R is methyl, vinyl or trifluoropropyl provided that the vinyl functionality is at least 2,

$$0 < \frac{s}{r} \leqq 1{,}350 < r + s < 2700$$

(b) from about 2 to about 300 parts by weight filler,

(c) from about 0 to about 5 parts by weight of a heat stabilizer,

(d) a crosslinking agent and a crosslinking catalyst, said crosslinking agent and catalyst being present in an amount sufficient to promote crosslinking of said at least one polyfluoroorganosiloxane.

4,711,819

MAGNETIC RECORDING MEDIUM

Kazuko Hansi, and Yasuyuki Yamada, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

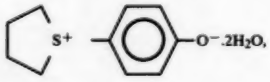
Continuation of Ser. No. 592,981, Mar. 23, 1984, abandoned. This application Oct. 10, 1985, Ser. No. 786,179

Claims priority, application Japan, Apr. 19, 1983, 58-67856

Int. Cl.[4] G11B *5/702*

U.S. Cl. 428—425.9 **2 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer coated thereon in which a ferromagnetic powder is dispersed in a binder, which is a binder system comprising at least one member selected from the group consisting of vinyl chloride copolymers and nitrocellulose as a predominate binder component mixed with a polyisocyanate in a proportion of 10 to 150 wt % to the binder and at least one isocyanate rection accelerating compound in a proportion of from 0.1 to 20 wt % to the isocyanate in the binder, said component selected from cthe group consisting of stannic chloride, cobalt naphthenate, ferrous acetylacetonate, 2-methylbenzoic acid, monochloroacetic acid, glutamic acid and,



and added just before coating the non-magnetic support with the magnetic recording layer.

4,711,820

METHOD OF SILICONIZATION OF SURFACES WITH LOWER ALKYL SILANES

Barry C. Arkles, Ambler, and William S. Brinigar, Bala Cynwyd, both of Pa., assignors to Petrarch Systems Inc., Bristol, Pa.

Filed Jun. 17, 1986, Ser. No. 875,149

Int. Cl.[4] C03C *17/00, 25/02;* B32B *9/04, 17/06*

U.S. Cl. 428—429 **20 Claims**

1. A method of treating a surface to be contacted by a protein-containing fluid to reduce protein adsorption to the surface, the method comprising coating the surface with a lower alkyl silane selected from the group consisting of monoalkyl silanes of the formula $RSiX_3$, wherein R is selected from ethyl and branched (C_3–C_5) alkyl and X is a hydrolyzable group, and dialkyl silanes of the formula R'_2SiX_2, wherein R' is (C_2–C_5) alkyl and X is as described above.

2. A method according to claim 1 wherein the surface is selected from glass and synthetic polymer surfaces.

4. A method according to claim 2 wherein the surface is a borosilicate glass surface.

14. A surface treated according to the method of claim 4.

4,711,821

OPTO-MAGNETIC RECORDING MEDIUM

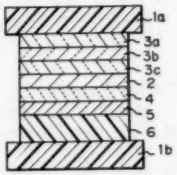
Kazuhiko Kikuchi, Kawasaki; Kazuoki Honguu, and Mitsuharu Sawamura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 749,631

Claims priority, application Japan, Jul. 13, 1984, 59-144402

Int. Cl.[4] G11B *7/24*

U.S. Cl. 428—457 **5 Claims**



1. An opto-magnetic recording medium comprising:

a transparent plastic substrate;

a magneto-optic recording layer provided on said plastic substrate; and

two or more thin film layers provided between said plastic substrate and said magneto-optic recording layer and decreasing the reflectance of said magneto-optic recording layer for light entering from the substrate side, said thin film layers including a layer formed of SiO which is in contact with said plastic substrate and a layer formed of Si_3N_4 which is interposed between said layer formed of SiO and said magneto-optic layer.

4,711,822

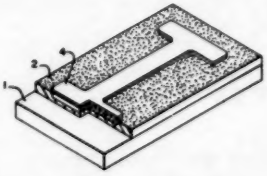
METAL CORE PRINTED CIRCUIT BOARDS

Wolfgang J. Choyke, Pittsburg; Susan Wood, Wilkinsburg; Luciano C. Scala, Murrysville; Melvin P. Zussman, Wilkinsburg; Leslie A. Doggrell, Penn Township, Westmoreland County, and Janet S. Lauer, Wilkinsburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1986, Ser. No. 818,949

Int. Cl.[4] B32B *15/08, 27/00;* B05D *5/12, 1/18*

U.S. Cl. 428—458 **22 Claims**



19. A coated substrate comprising:

(A) a conductive surface; and

(B) an imide polymeric coating applied by a conventional technique other than spin coating on said surface, only a portion of which has been exposed to an ion beam, then treated by wet blasting.

20. A substrate according to claim 19 including a metal coating electrolessly deposited over said portion.

4,711,823

HIGH STRENGTH STRUCTURAL MEMBER MADE OF AL-ALLOY

Haruo Shiina, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,586
Claims priority, application Japan, Nov. 12, 1984, 59-236734
Int. Cl.[4] C21D *1/06;* C22C *21/04;* B22F *3/14*
U.S. Cl. 428—547 4 Claims

1. A high strength structural member made of Al-alloy produced by the process comprising:

(a) pulverizing an aluminum alloy containing between 10 and 30 weight percent Si and between 4 and 33 weight percent Fe as solids in the supersaturated state through an atomizing process and quenching at a rate greater than 10^{30} 0° C./sec so as to produce particles of non-aluminum components smaller than 10 μm;

(b) pressing said powder in a mold;

(c) sintering by extrusion at a temperature between 330° C. and 520° C.; and

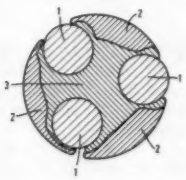
(d) subjecting the surface of the sintered body to a remelting-solidifying treatment using a high-density energy source to reduce the size of the crystal grains of non-aluminum compounds in the treated area to less than or equal to 1 μm.

4,711,824

HETEROGENEOUS WIRE AND PANE PROVIDED WITH SUCH A WIRE

Isidoor K. Van Hoof, and Herman J. C. M. Aarts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1986, Ser. No. 929,939
Claims priority, application Netherlands, Nov. 15, 1985, 8503141
Int. Cl.[4] B32B *15/00;* B21C *37/00*
U.S. Cl. 428—607 2 Claims



1. A composite, heterogeneous wire having a diameter of less than 50 μm and consisting of a core consisting of a eutectic mixture of silver and copper which is connected by fusion to a cladding comprising tungsten wires and copper wires distributed around the circumference of said core.

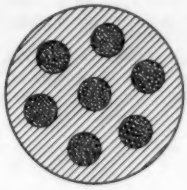
4,711,825

COMPOSITE ALUMINUM CONDUCTOR FOR PULSED POWER APPLICATIONS AT CRYOGENIC TEMPERATURES

Charles E. Oberly, Urbana; Harold L. Gegel, Kettering, both of Ohio, and James C. Ho, Wichita, Kans., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 10, 1986, Ser. No. 849,989
Int. Cl.[4] H01B *1/02*
U.S. Cl. 428—614 4 Claims

1. A conductor for use at cryogenic temperatures comprising high-purity aluminum filaments embedded in an aluminum based alloy matrix with diffusionless alloying elements, in which said aluminum filaments are at least 99.8% pure, and in



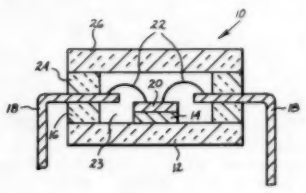
which said alloy comprises an aluminum-iron-cerium alloy matrix.

4,711,826

IRON-NICKEL ALLOYS HAVING IMPROVED GLASS SEALING PROPERTIES

Eugene Shapiro, Hamden, Conn., and Michael L. Santella, Knoxville, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 27, 1986, Ser. No. 822,973
Int. Cl.[4] C22C *38/08, 30/00;* H05K *5/06*
U.S. Cl. 428—630 16 Claims



1. An iron-nickel alloy having improved glass sealing ability, said alloy consisting essentially of from about 33% to about 60% nickel, from about 0.9% to about 3% silicon, from about 0.5% to about 3.5% aluminum and the balance essentially iron.

4,711,827

X-RAY INTENSIFYING SCREEN WITH IMPROVED TOPCOAT

Theodore P. Christini, Dushore, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1986, Ser. No. 833,537
Int. Cl.[4] G01J *1/58;* G03B *11/00*
U.S. Cl. 428—690 10 Claims

1. In an X-ray image intensifying screen comprising a support, an active layer containing fluorescent phosphor particles dispersed in a binder, and a protective topcoat covering said active layer, the improvement wherein said protective topcoat is a copolymer prepared from a mixture of approximately 5 to 50 weight percent acrylonitrile and 95 to 50 weight percent styrene.

4,711,828

CARBON MONOXIDE-OXYGEN FUEL CELL

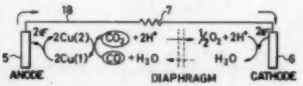
Tetsuyoshi Ishida; Kunio Okiura; Fumihiko Hanayama; Mutsuo Yamada, all of Kure, and Yoshijiro Arikawa, Yokohama, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1986, Ser. No. 866,400

Claims priority, application Japan, May 27, 1985, 60-113852; Sep. 26, 1985, 60-213403; Mar. 13, 1986, 61-55296

Int. Cl.[4] H01M *8/08*

U.S. Cl. 429—12 **19 Claims**



1. In a carbon monoxide-oxygen system fuel cell provided with a diaphragm between an anode and a cathode to separate the two electrodes, an improvement which comprises using a solution containing at least a monovalent copper and a halide as a complexing agent for said copper as the electrolytic solution for said anode, and reacting carbon monoxide in the form of a carbonyl complex of said monovalent copper in said electrolytic solution.

4,711,829

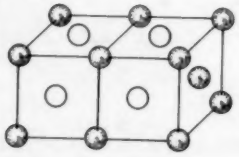
ORDERED TERNARY FUEL CELL CATALYSTS CONTAINING PLATINUM AND COBALT

Francis J. Luczak, Glastonbury, and Douglas A. Landsman, West Hartford, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Division of Ser. No. 812,106, Dec. 23, 1985, which is a continuation-in-part of Ser. No. 575,360, Jan. 30, 1984, Pat. No. 4,613,582, which is a division of Ser. No. 459,002, Jan. 17, 1983, Pat. No. 4,447,506. This application Mar. 16, 1987, Ser. No. 26,245

Int. Cl.[4] H01M *4/92*

U.S. Cl. 429—44 **3 Claims**



1. A fuel cell having an anode and a cathode with an electrolyte disposed therebetween, wherein the improvement comprises a ternary alloy cathode catalyst of cobalt, a noble metal, selected from the group consisting of platinum, iridium, rhodium and palladium and an element selected from the group consisting of transition Groups IV, V, VI, and VII supported on an electrically conductive carbon support, said catalyst having a structure which is an ordered solid solution and a catalytic activity for the electrochemical reduction of oxygen at least twice that of an unalloyed platinum catalyst supported on the same electrically conductive carbon-support.

4,711,830

IMAGE RECORDING MATERIAL COMPRISING PHOTOSENSITIVE LAYER AND RECORDING LAYER ON ELECTROCONDUCTIVE BASE

Masahiro Haruta; Yoko Kuwae, both of Tokyo; Satoshi Yuasa, Yokohama, and Toshihiko Miyazaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 820,800

Claims priority, application Japan, Jan. 24, 1985, 60-9843; Jan. 24, 1985, 60-9844

Int. Cl.[4] G03C *1/54, 1/71, 1/733*

U.S. Cl. 430—52 **19 Claims**

1. An image forming material comprising in sequence:
(a) an electrconductive base plate;
(b) a recording layer comprising an electrolytically polymerized film; and
(c) a photosenstiive layer comprising a polymer complex formed of an acidic polymer and a basic polymer.

4,711,831

SPECTRAL SENSITIZATION OF AMORPHOUS SILICON PHOTOCONDUCTIVE ELEMENTS WITH PHTHALOCYANINE AND ARYLAMINE LAYERS

Paul M. Borsenberger, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1987, Ser. No. 7,030

Int. Cl.[4] G03G *5/09*

U.S. Cl. 430—95 **14 Claims**

1. A multi-layer photoconductive element having a high degree of photosensitivity in both the visible and near infrared regions of the spectrum, said element comprising:
a support;
a layer of hydrogenated amorphous silicon;
a sensitizing layer comprising a phthalocyanine that serves as a spectral sensitizing agent;
and a supersensitizing layer comprising an arylamine that serves as a chemical sensitizing agent;
said supersensitizing layer being interposed between and in contact with both said layer of hydrogenated amorphous silicon and said sensitizing layer.

4,711,832

COLORED ELECTROSCOPIC TONERS CONTAINING QUENCHED ESTERIFIED RHODAMINE DYES

William T. Gruenbaum; Julie P. Harmon, and Luther C. Roberts, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 5, 1986, Ser. No. 859,584

Int. Cl.[4] G03G *9/08, 9/10*

U.S. Cl. 430—106 **14 Claims**

1. An electroscopic toner comprising:
(a) a compatible polymeric binder,
(b) a rhodamine dye having a non-lactonizing ester-containing phenyl group in the 9-position, and
(c) a fluorescence-quenching dye.

4,711,833

POWDER COATING PROCESS FOR SEAMLESS SUBSTRATES

T. Brian McAneney, Burlington; Rafik O. Loutfy, Willowdale, both of Canada; Joseph Mammino, Penfield, N.Y.; Deborah J. Nichol-Landry, Rochester, N.Y., and Donald S. Sypula, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1986, Ser. No. 842,964

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—131 **58 Claims**

1. A process for the fabrication of seamless substrates which comprises (1) providing a substrate with a release coating composition thereover; (2) depositing thereon by electrostatic powder spraying a polymer; (3) melting the polymer; (4) cooling the melted polymer; and (5) subsequently separating the formed seamless substrate.

4,711,834

LASER-IMAGEABLE ASSEMBLY AND PROCESS FOR PRODUCTION THEREOF

Alan Butters, Ipswich; Roger N. Barker, Clacton-on-Sea, and Stuart C. Rennison, Hadleigh Nr Ipswich, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 8, 1985, Ser. No. 721,183

Claims priority, application United Kingdom, Apr. 25, 1984, 8410515

The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.

Int. Cl.[4] G03C *1/72*; G03F *1/00, 7/10*

U.S. Cl. 430—201 **9 Claims**

1. A multiple-layer laser-imageable assembly comprising a transparent substrate and an associated energy absorbent transfer layer comprising particles which absorb laser energy dispersed in a heterogeneous resin layer having physical discontinuities in the outermost surface and wherein the assembly comprises at least one further layer selected from

(a) an intermediate priming layer between the substrate and transfer layer,

(b) a hydrophilic protective coating layer on a surface of the transfer layer remote from the substrate, and

(c) a lubricant coating layer remote from the substrate.

7. A method of making a multiple layer laser-imageable assembly comprising applying to a transparent substrate sequential layers of flowable coating media and drying each applied layer of coating medium before applying a subsequent flowable layer, wherein the sequentially applied layers comprise a transfer layer associated with the substrate, said transfer layer comprising laser energy absorbent particles dispersed in a heterogeneous resin binder layer having physical discontinuities in the outermost surfaces, and at least one further layer selected from:

(a) an intermediate priming layer between the substrate and transfer layer,

(b) a hydrophilic protective coating layer on a surface of the transfer layer remote from the substrate, and

(c) a lubricant coating layer remote from the substrate,

the applied energy absorbent transfer medium being dried

(1) at a sufficiently low temperature, and optionally,

(2) in the presence of a non-solvent for the resin binder,

to develop a heterogeneous resin transfer layer associated with the substrate.

8. A method of making an imaged printing plate by placing the coated surface of an assembly according to claim 1, or made according to claim 7, in intimate contact with a surface of a printing plate former and directing a laser beam image pattern through the transparent substrate of the assembly to transfer a portion of the coated surface corresponding to the image pattern from the substrate to the printing surface, then, optionally, effecting cross-linking of the transferred portion.

4,711,835

PROCESS FOR PHOTOLITHOGRAPHING A THICK LAYER OF PASTE DEPOSITED ON A SUBSTRATE

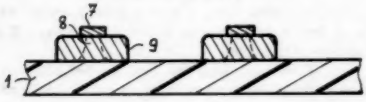
Michel Dufour, Malesherbes, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 4, 1985, Ser. No. 804,596

Claims priority, application France, Dec. 7, 1984, 84 18776

Int. Cl.[4] H05K *3/02*

U.S. Cl. 430—314 **9 Claims**



1. A process for photolithographing a thick layer of paste deposited on a flat substrate, the paste being formed of solid particles which have an electric function (conductive, resistive, dielectric) or a mechanical protective function, and an organic binder, comprising the following operations:

(1) the thick layer is dried at 80°–120° C.,

(2) a layer of photosensitive resin is deposited on the thick layer, and then is exposed to ultraviolet radiation through a high definition photographic mask and developed,

(3) the parts of the thick layer which are not protected by the remaining patterns of the photosensitive resin mask are chemically dissolved using a mixture of organic solvents, said mixture of organic solvents having a differential solubility with respect to the organic binder of the thick paste layer and with respect to the photosensitive resin, the solubility of the thick layer being greater than the solubility of the photosensitive resin, said chemical dissolution of the organic binder of the thick layer being accompanied by mechanical sweeping of the solid particles, the mixture of solvents being sprayed on the thick layer at a pressure between 5 and 25 kg/cm^2 and at an angle between 0° to 30° with respect to the plane of the substrate,

(4) the thick layer is baked at 850° C. for sintering it and eliminating the photosensitive resin mask.

4,711,836

DEVELOPMENT OF POSITIVE-WORKING PHOTORESIST COMPOSITIONS

Lawrence Ferreira, Fall River, Mass., assignor to Olin Hunt Specialty Products, Inc., Palisades Park, N.J.

Division of Ser. No. 648,568, Sep. 10, 1984. This application Aug. 11, 1986, Ser. No. 895,628

Int. Cl.[4] G03C *5/00*; G03F *7/26*

U.S. Cl. 430—326 **12 Claims**

1. A method of developing an imagewise-exposed layer of positive-working photoresist composition comprising the steps of:

applying a layer of a positive-working photoresist composition to a substrate; said photoresist composition comprising an admixture of a novolak-type resin and diazoketone photosensitive agent;

subjecting said photoresist layer to an imagewise-exposure of radiation;

contacting the imagewise-exposed layer to an aqueous alkaline developing solution comprising an admixture of a quaternary ammonium hydroxide developing agent with an effective amount of an additive compound selected from the group consisting of 1,3,5-trihydroxybenzene, 4-methylesculetin, and mixtures thereof;

removing the imagewise-exposed areas of said photoresist compositions without leaving exposed residual photoresist material at the interface of the edges of the unexposed areas of the photoresist layer and the substrate.

4,711,837

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Seiji Ichijima; Mitsunori Ono; Isamu Itoh; Keiji Mihayashi; Koji Tamoto, and Yoshisada Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1985, Ser. No. 769,903

Claims priority, application Japan, Aug. 27, 1984, 59-177670

Int. Cl.[4] G03C *1/40, 7/32, 7/26*

U.S. Cl. 430—548 **46 Claims**

1. A silver halide color photographic material comprising a support having provided thereon at least one silver halide emulsion layer, wherein the photographic material contains a compound represented by the general formula (I):

A—X—Dye (I)

wherein A represents a group capable of releasing X-Dye upon reaction with the oxidation product of a developing agent selected from the group consisting of a yellow coupler residue,

a magenta coupler residue, a cyan coupler residue, a non-color forming coupler residue or a hydroquinone; X represents an oxygen atom, a sulfur atom or an imino group directly attached to the coupling position of A; and Dye represents a dye residue which has X as an auxochrome; and A and Dye may have a connection other than X to form a cyclic structure; and said compound represented by the general formula (I) may be a bis-type coupler or a polymer coupler which compound has a dye portion in which the maximum absorption wavelength is shifted by a bond that is cleaved upon reaction with an oxidation product of a developing agent and is capable of forming a diffusion resistant compound having a dye portion possessing the maximum absorption wavelength which is not shifted as a result of the reaction with an oxidation product of a developing agent.

4,711,838

PHOTOGRAPHIC ELEMENTS SENSITIVE TO NEAR INFRARED

Nicholas E. Grzeskowiak, Harlow, Great Britain, and James B. Philip, Jr., St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 26, 1985, Ser. No. 769,596

Int. Cl.[4] G03C *1/02, 1/176, 1/84, 1/06*

U.S. Cl. 430—568 **27 Claims**

1. A photographic element comprising a support transparent to near infrared radiation, one or more layers of a silver halide emulsion having grains of an average diameter of not more than 0.4 micron, sensitised to near infrared radiation, characterised in the element comprises one or more of:

(i) a topcoat layer which is an outermost layer on the same side of the support as the photosensitive emulsion which topcoat layer is a diffuse transmitting layer with respect to near infrared radiation,

(ii) a backing layer which is an outermost layer on the side of the support remote from the photosensitive emulsion which backing layer is a diffuse reflecting layer or absorbing layer with respect to near infrared radiation,

(iii) a subbing layer which is positioned between the support and the photosensitive emulsion which subbing layer is a diffuse transmitting or absorbing layer with respect to near infrared radiation, said absorbing layer having an optical density of at least 0.75 within the range of 750 to 1500 nm in the absence of a diffuse transmitting layer and an optical density of at least 0.3 within the range of 750 to 1500 nm in combination with a diffuse transmitting layer,

whereby the element may be imaged by a laser scanning system emitting near infrared radiation substantially without formation of non-contact interference fringes.

4,711,839

IMMUNE COMPLEX ASSAY

Anil K. Singhal, Edmonds, Wash., assignor to IMRE Corporation, Seattle, Wash.

Filed Jan. 11, 1985, Ser. No. 690,556

Int. Cl.[4] G01N *33/53, 33/564, 33/543;* **C12Q** *1/00*

U.S. Cl. 435—4 **11 Claims**

1. A method for detecting immune complexes containing a specific antigenic marker in a plasma or serum sample, said method comprising:

enriching immune complexes relative to other proteins in the sample by a factor of at least 1.2 by passage of the sample through an immunoadsorbent column capable of specifically binding the immune complexes, followed by elution of the enriched sample from the column;

separating intact immune complexes from the enriched sample by binding to Raji cells or Clq; and

detecting the specific antigenic marker in the intact complexes separated from the enriched sample.

4,711,840

POLYMERIZATION-INDUCED SEPARATION IMMUNOASSAYS

Robert C. Nowinski, and Allan S. Hoffman, both of King County, Wash., assignors to Genetic Systems Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 574,558, Jan. 27, 1984, which is a continuation-in-part of Ser. No. 550,929, Nov. 10, 1983, Pat. No. 4,511,478. This application Nov. 7, 1984, Ser. No. 668,247

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] G01N *33/537;* **C12Q** *1/68*

U.S. Cl. 435—7 **15 Claims**

1. An immunoassay method for determining the presence of more than one analyte in a fluid sample suspected of containing one or more of said analytes, comprising:

(a) combining said fluid sample with an addition monomer-/analyte conjugate for each analyte being determined to form a fluid sample mixture;

(b) combining said mixture with reporter/reactant conjugates specific for bonding to each analyte thought to be contained in said fluid sample mixture under conditions favorable for the formation of the reporter-labelled analyte complexes and reporter-labelled monomer/analyte complexes, each reporter/analyte conjugate providing a detectably different signal from every other reporter present in said fluid sample mixture;

(c) separating said reporter-labelled monomer/analyte-conjugate complexes by initiating addition polymerization in said mixture; and

(d) detecting the incorporation of each reporter into each said polymerized complex as a measure of the analytes present in the sample.

4,711,841

METHOD FOR DETERMINING ONE OR MORE ANTIGENS IN A SAMPLE

Hans C. G. Kronvall, Lund, Sweden, assignor to Pharmacia Aktiebolaget, Upsala, Sweden

Continuation of Ser. No. 358,814, Mar. 16, 1982, abandoned, which is a continuation of Ser. No. 905,389, May 12, 1978, abandoned, which is a continuation of Ser. No. 647,269, Jan. 7, 1976, abandoned, which is a continuation of Ser. No. 409,560, Oct. 25, 1973, abandoned. This application Oct. 10, 1984, Ser. No. 659,424

Claims priority, application Sweden, Nov. 6, 1972, 14328/72; Feb. 8, 1973, 73017774

Int. Cl.[4] G01N *33/53, 33/554*

U.S. Cl. 435—7 **11 Claims**

1. A method for testing for the presence of a suspected specific antigen in a biological specimen of animal origin, comprising the step of combining the specimen containing the suspected antigen with a protein-A-containing, microbial cell suspension sensitized with an IgG antibody specific to the suspected antigen so that the Fc-part of the antibody is attached to protein A which in turn is attached to the microbial cell, whereby agglutination occurs if the test is positive, said antibody showing substantially no tendency toward self-agglutination of the microbial cells.

4,711,842

METHOD FOR PRODUCTION OF BIOLOGICALLY ACTIVE SUBSTANCES

Tadayoshi Taniyama, Tokyo, and Koichi Yoshida, Shizuoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1984, Ser. No. 589,832

Claims priority, application Japan, Mar. 15, 1983, 58-41409

Int. Cl.[4] C12P *21/00;* **C12N** *15/00*

U.S. Cl. 435—68 **5 Claims**

1. A method of producing a biologically active substance produced by a macrophage which comprises culturing a hy-

brid cell line obtained by fusing (1) a human tumor cell line derived from THP-1 or U-937 and which does not grow in a medium containing aminopterin, azaserine, or aminopterin and azaserine or a cell line derived therefrom with (2) a human non-tumor macrophage capable of producing said biologically active substance.

4,711,843

METHOD AND VECTOR ORGANISM FOR CONTROLLED ACCUMULATION OF CLONED HETEROLOGOUS GENE PRODUCTS IN *BACILLUS SUBTILIS*

Shing Chang, Hercules, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 221,800, Dec. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 128,537, Mar. 10, 1980, abandoned. This application Jan. 26, 1983, Ser. No. 461,248

Int. Cl.[4] C12P *21/00, 21/02, 21/04, 19/34*; C12N *15/00, 9/86, 1/00, 1/20*; C12R *1/125, 1/19*; C07H *21/04*

U.S. Cl. 435—68 **40 Claims**

1. A method for producing a predetermined protein comprising providing growth conditions in a growth medium for Gram-positive bacteria containing hybrid cloning vectors, said vectors having a gene therein for said predetermined protein, said predetermined protein being non-indigenous to the Gram-positive bacteria, said gene being located and oriented in said vector such as to be under the control of an operator, promoter, and ribosomal binding site sequence, said predetermined protein being under the control of a transport mechanism comprising a portion of a Bacillus secretion leader sequence that functions for secretion by which said predetermined protein is secreted by said Gram-positive bacteria, culturing said bacteria under conditions suitable for the production and secretion of said predetermined protein, and recovering said predetermined protein from said growth medium.

4,711,844

MODIFIED SIGNAL PEPTIDES

Shing Chang, Hercules, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Filed Mar. 9, 1983, Ser. No. 473,820

Int. Cl.[4] C12N *15/00, 1/20, 1/00*; C12P *21/00*

U.S. Cl. 435—317.1 **6 Claims**

1. A plasmid comprising a DNA sequence encoding a signal sequence comprising the sequence met lys leu trp phe ser thr leu lys leu lys lys ala ala ala val leu leu phe ser cys val ala leu ala gly ser ala asn asn gln thr asn ala.

4,711,845

PORTABLE TEMPERATURE-SENSITIVE CONTROL CASSETTE

David H. Gelfand, and Frances C. Lawyer, both of Oakland, Calif., assignors to Cetus Corporation, Emeryville, Calif.

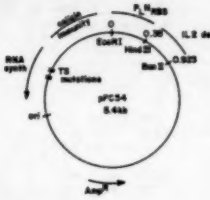
Continuation-in-part of Ser. No. 646,693, Aug. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 578,133, Feb. 8, 1984, abandoned. This application Dec. 24, 1984, Ser. No. 685,312

Int. Cl.[4] C12P *21/00, 19/34*; C12N *15/00, 1/20, 1/00*; C07H *17/00*

U.S. Cl. 435—68 **26 Claims**

2. A portable, regulatable control cassette for expression of a heterologous in procaryotic hosts which cassette comprises:

a first DNA sequence which is the P_L promoter operably linked to a second DNA sequence corresponding to N_{RBS}, both aforesaid DNA sequences operably linked to an ATG start codon, all upstream of a third DNA sequence having a restriction site which is not present elsewhere in the cassette and which permits cleavage within 6 bp downstream of the G of the ATG start codon.



4,711,846

PROCESS FOR THE PRODUCTION OF L-ASPARTYL-L-PHENYLALANINE METHYL ESTER OR L-ASPARTYL-L-PHENYLALANINE

Kenzo Yokozeki, and Koji Kubota, both of Kawasaki, Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Apr. 27, 1984, Ser. No. 604,523

Claims priority, application Japan, Apr. 28, 1983, 58-75558; Apr. 28, 1983, 58-75559

Int. Cl.[4] C12P *21/02*; C12R *1/19*; A23L *1/236*

U.S. Cl. 435—70 **4 Claims**

1. A process for the production of a sweetening agent, which comprises:

contacting in an aqueous medium L-aspartic acid and L-phenylalanine methyl ester with at least one *E. coli* FERM-BP477 microorganisms or a protein-containing material isolated from said microorganism, said microorganism or protein-containing material isolated therefrom containing one or more enzymes capable of forming L-aspartyl-L-phenylalanine methyl ester by the condensation of L-aspartic acid and L-phenylalanine methyl ester; and

isolating said L-aspartyl-L-phenylalanine methyl ester formed in said aqueous medium.

4,711,847

PREPARATION OF SECRETIN

Wolfgang König, Hofheim am Taunus; Joachim Engels, Kronberg; Eugen Uhlmann, Königstein, and Waldemar Wetekam, Eppstein, all of Fed. Rep. of Germany, assignors to 501 Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,789

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328793

Int. Cl.[4] C12P *21/02, 21/06*; C12N *15/00, 9/78*

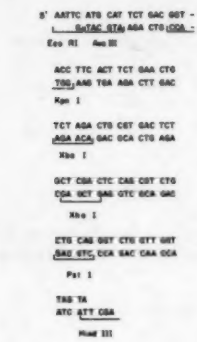
U.S. Cl. 435—70 **5 Claims**

1. A process for preparing a polypeptide of formula I

$$Y—R—NH_2 \quad (I)$$

in which Y is methionine or a radical of a bacterial protein bonded via methionine to R, and R is the amino acid sequence of secretin wherein said process comprises (1) producing by using recombinant DNA techniques a polypeptide of formula II

$$Y—R—NH—CH_2—COOH \quad (II)$$



in which Y and R are defined as above, and (2) enzymatically converting the polypeptide of formula II into the polypeptide of the formula I with an amidating enzyme.

4,711,848

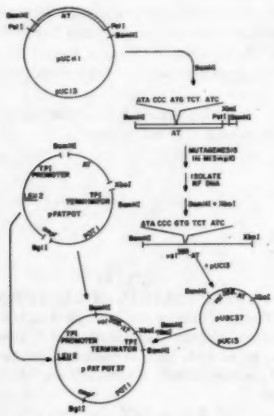
SITE SPECIFIC MUTAGENESIS IN ALPHA-1-ANTITRYPSIN

Margaret Y. Insley, Woodinville, and Glenn Kawasaki, Seattle, both of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 589,410, Mar. 14, 1984, abandoned. This application Mar. 7, 1985, Ser. No. 709,382

Int. Cl.[4] C12P *19/34, 21/02;* **C12N** *15/00, 1/00*

U.S. Cl. 435—91 **17 Claims**



1. A method for producing closed circular DNA molecules coding for a human structural gene for X^{358}-alpha-1-antitrypsin wherein X is alanine, valine, glycine, phenylalanine, arginine or lysine, comprising the steps of:

(A) preparing a circular single-stranded cDNA molecule comprising the coding sequence or the complement of the structural gene for wild-type human alpha-1-antitrypsin;

(B) annealing to said single-stranded cDNA (1) a linear oligonucleotide, characterized as being complementary to a segment of said single-stranded DNA, and comprising a codon mismatch corresponding to the amino acid in position 358 of said wild-type alpha-1-antitrypsin, wherein said mismatch comprises a codon for alanine, valine, glycine, phenylalanine, arginine or lysine; and (2) a primer;

(C) extending said oligonucleotide and primer;

(D) ligating the termini of said extended oligonucleotide and primer to form a gapped circular double-stranded DNA molecule;

(E) transfecting said double-stranded gapped circular DNA into a host microorganism to form said closed circular DNA molecule comprising said structural gene coding for human X^{358}-alpha-1-antitrypsin.

4,711,849

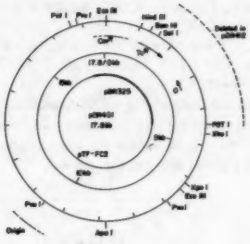
CONSTRUCTION OF SELECTABLE SHUTTLE CLONING VECTORS FOR *THIOBACILLUS FERROOXIDANS*

Douglas E. Rawlings, and David R. Woods, both of Rondebosch, South Africa, assignors to General Mining Union Corporation, Limited, Johannesburg, South Africa

Filed Nov. 1, 1984, Ser. No. 667,254

Int. Cl.[4] C12P *19/34;* **C12N** *15/00, 7/00*

U.S. Cl. 435—91 **6 Claims**



1. A method of constructing resistance vectors for Thiobacillus ferrooxidans which includes the steps of;

(a) extracting a cryptic DNA plasmid from a *T. ferrooxidans* strain, cleaving the *T. ferrooxidans* plasmid and a second plasmid which contains a chloramphenicol resistance gene and an *E. coli* origin of replication with the same restriction enzyme, and ligating the plasmids to form a recombinant plasmid,

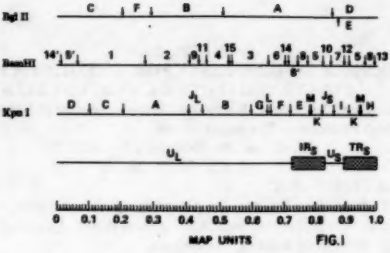
(b) transforming *E. coli* cells with the recombinant plasmid and selecting for chloramphenicol resistant transformants capable of replication in *E. coli* and,

(c) removing the *E. coli* origin of replication from the recombinant plasmid by cleavage with a restriction enzyme to form a deleted recombinant plasmid, capable of replication both in *E. coli* and *T. ferrooxidans.*

4,711,850
PSEUDORABIES VIRUS MUTANTS, VACCINES CONTAINING SAME, METHODS FOR THE PRODUCTION OF SAME AND METHODS FOR THE USE OF SAME

Malon Kit, and Saul Kit, both of Houston, Tex., assignors to NovaGene, Inc. and Baylor College of Medicine, both of Houston, Tex.

Filed Jan. 28, 1986, Ser. No. 823,439
Int. Cl.[4] C12N *7/00*; A61K *39/205*
U.S. Cl. 435—235 **63 Claims**

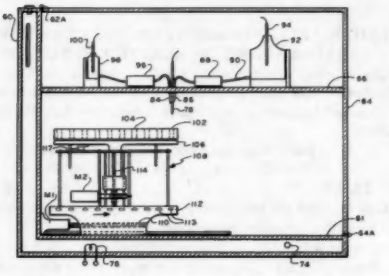


1. A pseudorabies virus which fails to produce any antigenic g92 polypeptides as a result of a deletion, an insertion or both a deletion and an insertion in the g92 gene.

4,711,851
TEST APPARATUS FOR DETERMINING A METABOLIC CHARACTERISTIC OF MICROORGANISMS

Thomas F. McNamara, Port Jefferson, and Fred Confessore, St. James, both of N.Y., assignors to State University of New York, Albany, N.Y.

Filed May 21, 1984, Ser. No. 612,462
Int. Cl.[4] C12M *1/00*
U.S. Cl. 435—287 **19 Claims**



1. A tester for determining a metabolic characteristic of microorganisms suspended in a medium comprising:

a housing means having an internal ambient temperature;

a reagent supply mounted in said housing means and containing a quantity of at least one test reagent; a probe means mounted in said housing means and sized to be inserted into said medium, there existing a probe temperature at said probe means, said probe means providing a reaction signal signifying the probe temperature at said probe means;

a dispensing means coupled between said reagent supply and said probe means for delivering at the probe means from the reagent supply said test reagent;

reference means mounted in said housing means for providing a reference signal responsive to said ambient temperature, said reference means being spaced from said probe means to preclude insertion into said medium; and

control means coupled to said probe means, said reference means and said dispensing means for controlling the amount of said test reagent dispensed by said dispensing means and for indicating the relative variation between said reaction signal and said reference signal after delivery of said test reagent at said probe means.

4,711,852
CONTROL FOR BLOOD GAS ANALYZERS AND HEMOGLOBIN ANALYSIS

Walter Jacobson, Denville; Stephen C. Riggio, Milford, and James E. Turner, Boonton, all of N.J., assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 5, 1984, Ser. No. 667,947
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—15 **22 Claims**

1. A process for stabilizing mammalian erythrocytes for use in a blood gas-hemoglobin analysis control whereby specific hemoglobin values for oxyhemoglobin, carboxyhemoglobin and methemoglobin are maintained which comprises:

(a) suspending said erythrocytes in a buffered fixing medium comprising a water solution of a buffering agent, said medium having a pH of about 7.3 to about 11.3;

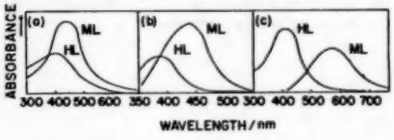
(b) contacting the erythrocytes with a gas, wherein the gas is, oxygen or carbon monoxide, in the presence of a protein cross-linking agent at a temperature 20° C. to about 30° C. for a reaction time of about 15 minutes to about 60 minutes; and

(c) recovering the stabilized erythrocytes.

4,711,853
METHOD OF DETECTING POTASSIUM IONS USING TRIFLUOROMETHYL-SUBSTITUTED CHROMOGENIC CROWN ETHERS

Gilbert E. Pacey, Oxford, Ohio, and Bernard P. Bubnis, Reston, Va., assignors to The President and Trustees of the Miami University, Oxford, Ohio

Continuation-in-part of Ser. No. 559,478, Dec. 8, 1983, abandoned, which is a division of Ser. No. 386,066, Jun. 7, 1982, Pat. No. 4,436,923. This application Dec. 18, 1985, Ser. No. 810,855
Int. Cl.[4] G01N *21/75, 33/50*
U.S. Cl. 436—74 **17 Claims**



1. An organic reagent for extracting potassium from an aqueous solution comprising:

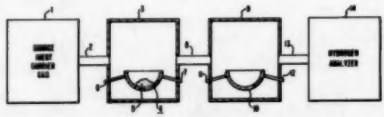
(a) a spectroscopic quality chloroform solvent; and

(b) the crown ether, 4'-(2",4"-dinitro-6"-trifluoromethylphenyl) aminobenzo-15-crown-5, dissolved in said chloroform solvent, and wherein the concentration of said crown ether in said solvent is in the range 1×10^{-4} molar to 1×10^{-2} molar.

4,711,854
METHOD OF MEASURING MOISTURE IN A BURNABLE ABSORBER

Richard A. Pregnall, Columbia, and Archie M. LeGrand, Jr., Sumter, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1986, Ser. No. 857,011
Int. Cl.[4] G01N *33/18*
U.S. Cl. 436—144 **3 Claims**



1. A method of measuring the amount of moisture contained in a sample of a burnable absorber having a moisture content in excess of 100 ppm comprising:

(1) heating said sample in a first enclosed chamber in the presence of a water dissociation catalyst, whereby water in said sample is dissociated into hydrogen and oxygen;

(2) passing vapors from said first enclosed chamber to a second enclosed chamber which contains a water dissociation catalyst, whereby water in said vapors is dissociated into hydrogen and oxygen;

(3) analyzing said vapors from said second enclosed chamber to determine their hydrogen content.

4,711,855
DERIVATIVES OF 3,5,3-TRIIODOTHYRONINE

Richard R. Feinberg, Sharon, Mass., assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Feb. 5, 1985, Ser. No. 698,108
Int. Cl.[4] G01N *33/534, 33/543;* C07D *233/00, 239/00*
U.S. Cl. 436—500 **12 Claims**

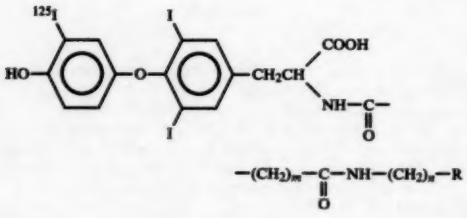
5. An immunoassay for the direct measurement of free 3,5,3'-triiodothyronine in a liquid sample in which the 3,5,3'-triiodothyronine is present in both free and bound states, which immunoassay comprises the steps of:

A. combining the sample with a radiolabelled derivative of 3,5,3'-triiodothyronine and antibody specific for 3,5,3'-triiodothyronine said antibody being immobilized on a solid phase;

B. incubating the mixture which results from step A;

C. separating the solid phase from the liquid phase;

D. measuring the amount of the radiolabeled derivative of 3,5,3'-triiodothyronine present in either phase; wherein the radiolabeled derivative of 3,5,3'-triiodothyronine has the following general formula:



in which m is an integer from 2 to 4, n is an integer from 1 to 4, and R is a monovalent, unsubstituted, fully unsaturated five- or six-membered monocyclic heterocyclic group containing either one or two nitrogen atoms as the only hetero atoms; and

E. determining the free 3,5,3'-triiodothyronine from the measurement of the derivative of 3,5,3'-triiodothyronine.

4,711,856
NUCLEAR BINDING ASSAY FOR STEROID RECEPTOR FUNCTIONALITY IN CANCEROUS CELLS

Thomas C. Spelsberg, Rochester, Minn., assignor to Mayo Medical Resources, Rochester, Minn.

Filed Sep. 19, 1984, Ser. No. 652,295
Int. Cl.[4] G01N *33/567*
U.S. Cl. 436—504 **18 Claims**

1. A method for rapidly determining the presence of functional cellular steroid receptors by assaying a tissue sample for nuclear steroid binding comprising:

(a) fragmenting said tissue sample;

(b) digesting said fragmented tissue with collagenase;

(c) isolating the cells from said digested tissue;

(d) incubating said cells with an amount of a radiolabeled steroid capable of complexing with and saturating said receptors;

(e) isolating the cellular nuclei; and

(f) measuring the bound radioactivity and the total DNA of said nuclei.

4,711,857
TAILORABLE INFRARED SENSING DEVICE WITH STRAIN LAYER SUPERLATTICE STRUCTURE

Li-Jen Cheng, LaCrescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 28, 1986, Ser. No. 901,114
Int. Cl.[4] H01L *31/04, 29/12, 31/06*
U.S. Cl. 437—3 **16 Claims**

1. A method for fabricating a photodetector with a tunable wavelength detection range, comprising:

growing a Ge_xSi_{1-x}/Si superlattice,

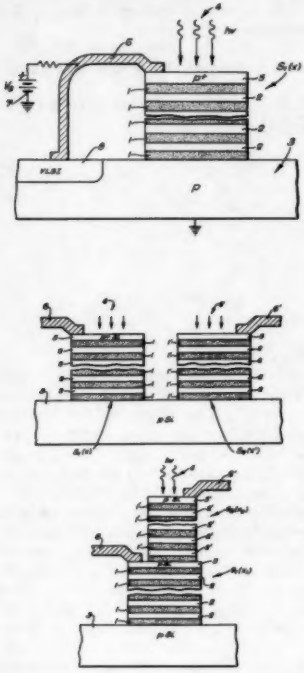
wherein Ge_xSi_{1-x} layers of the superlattice are doped with a p-type impurity and Si layers of the superlattice are intrinsic; and

controlling the value of x to establish a desired valence band energy difference between the valence band of the p-doped Ge_xSi_{1-x} superlattice layers and the valence band of the intrinsic Si superlattice layers to thereby tune the wavelength detection range of the Ge_xSi_{1-x}/Si supperlattice.

4. A method for manufacturing a photodetector with tailorable wavelength sensitivity comprising:

growing a superlattice including two different layers joined to form a semiconductive heterojunction, one of the layers being a p-impurity doped semiconductive alloy of the general ternary form $(A_xB_{1-x})_yC_{1-y}$ whose energy band characteristics are a function of x, and the other of the layers being an intrinsic semiconductor having a valence

band of lower energy than the valence band of the $(A_xB_{1-x})_yC_{1-y}$ layer; and



controlling the value of x to adjust the energy difference between the valence bands of said two different layers to thereby tailor the wavelength sensitivity of the superlattice.

4,711,858

METHOD OF FABRICATING A SELF-ALIGNED METAL-SEMICONDUCTOR FET HAVING AN INSULATOR SPACER

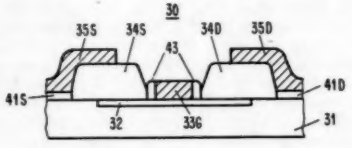
Christoph S. Harder, Zurich; Heinz Jaeckel, Kilchberg, and Hans P. Wolf, Zurich, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1986, Ser. No. 875,835

Claims priority, application European Pat. Off., Jul. 12, 1985, 85108694.2

Int. Cl.⁴ H01L *21/302*

U.S. Cl. 437—99 **10 Claims**



1. A method of fabricating a self-aligned metal-semiconductor field effect transistor, the transistor being formed on a semi-insulating semiconductor substrate and comprising a current channel and associated source, gate and drain electrodes, characterized in that it comprises the following steps:

forming an active channel layer at the surface of said semiconductor substrate,

depositing a refractory metal gate layer over said substrate surface,

selectively etching said gate layer to form said gate electrode,

depositing a thin dielectric layer over said gate electrode and over said substrate surface,

etching said dielectric layer so as to form an insulating sidewall layer on the vertical ediges of said gate electrode,

forming a highly doped continuous semiconductor contact layer over said substrate surface, over said gate electrode and over said insulating sidewall layer, said contact layer being mono-crystalline material over said substrate surface and poly-crystalline material over said gate electrode and over said insulating sidewall layer,

removing said poly-crystalline material, and

depositing and selectively etching a metal layer over said mono-crystalline material to form said source and said drain electrodes.

4,711,859

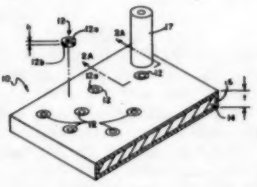
METHOD FOR FORMING AN INSULATOR HAVING A CONDUCTIVE SURFACE

Dino E. Argentini, Danvers, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 24, 1984, Ser. No. 614,097

Int. Cl.⁴ H01L *23/02*

U.S. Cl. 437—209 **9 Claims**



1. A method of providing a conductive layer on a first one of a pair of opposing surfaces of a spacer member comprising the steps of:

masking the second one of the pair of opposing surfaces and sidewall surfaces of the member with a conformable masking material while leaving the first one of the pair of opposing surfaces exposed; and

providing the conductive layer on the exposed, first opposing surface of the member.

4,711,860

MODIFIED CORDIERITE GLASS CERAMIC COMPOSITE

Kishor P. Gadkaree, Big Flats; William L. Haynes, and Kun-Er Lu, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

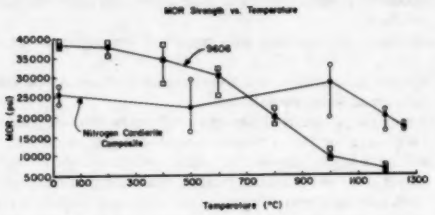
Filed Mar. 12, 1986, Ser. No. 838,806

Int. Cl.⁴ C03C *10/08*

U.S. Cl. 501—9 **23 Claims**

1. A glass ceramic composite material comprising Si_3N_4.

whiskers in a nitrogen doped cordierite glass ceramic wherein the material comprises between about 5 and about 50 weight



percent Si_3N_4whiskers and between about 50 and 95 weight percent nitrogen doped cordierite glass ceramic.

4,711,861

SINTERED ALUMINUM NITRIDE BODY AND METHOD FOR MAKING

Kentaro Sawamura; Yoshio Kosaka, and Masayasu Yamaguchi, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 787,091, Oct. 15, 1985, abandoned. This application Feb. 20, 1987, Ser. No. 16,957

Claims priority, application Japan, Oct. 15, 1984, 59-215971; Dec. 17, 1984, 59-265852; Dec. 17, 1984, 59-265853; Dec. 17, 1984, 59-265855; Dec. 17, 1984, 59-265856

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—98 **14 Claims**

1. A sintered aluminum nitride body prepared by sintering aluminum nitride in admixture with a sintering aid selected from the group consisting of borides; carbides, of calcium, strontium, barium and rare earth metals, and mixtures thereof.

4,711,862

DIELECTRIC CERAMIC COMPOSITIONS

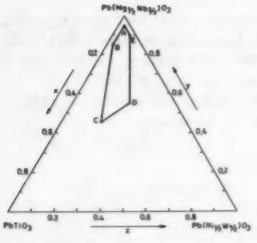
Yoichiro Yokotani, Ibaraki; Junichi Kato; Masamitsu Nishida, both of Osaka; Syunichiro Kawashima, Nishinomiya, and Hiromu Ouchi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 26, 1985, Ser. No. 813,521

Claims priority, application Japan, Dec. 27, 1984, 59-280317; Jan. 28, 1985, 60-13685; Feb. 19, 1985, 60-30910

Int. Cl.[4] C04B *35/46*

U.S. Cl. 501—136 **3 Claims**



1. A ceramic compositions comprising a substance represented by the formula

$$PbTi_x(Mg_{1/3}Nb_{2/3})_y(Ni_{1/2}W_{1/2})_zO_3$$

wherein $x+y+z=1$ and the values of x,y and z fall within the ranges represented by the polygon ABCDE in the accompanying composition diagram of $PbTiO_3$-$Pb(Mg_{1/3}Nb_{2/3})O_3$-$Pb(Ni_{1/2}W_{1/2})O_3$ ternary system.

4,711,863

IMMOBILIZED EXTRACTANTS

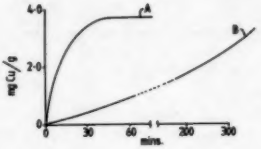
Michael Streat, Wembley, England, and Sofia Belfer-Canterman, Beer-Sheva, Israel, assignors to National Research Development Corporation, England

Filed Mar. 10, 1986, Ser. No. 838,298

Claims priority, application United Kingdom, Mar. 12, 1985, 8506335

Int. Cl.[4] B01J *37/34, 20/26;* B05D *3/06;* C08J *5/24*

U.S. Cl. 502—5 **14 Claims**



1. A process for the production of a solid, particulate immobilised extractant, which process comprises adsorbing (a) a liquid extractant which is not homopolymerisable onto (b) a porous, solid, particulate, substrate; adsorbing (c) a monomer onto the substrate; and polymerising the adsorbed monomer (c) by subjecting the monomer (c) to irradiation, thereby entrapping the liquid extractant (a) on substrate (b).

12. A process for the production of a solid, particulate immobilized extractant, which comprises adsorbing (a) a liquid extractant which is not homopolymerizable selected from the group consisting of organic neutral or acid esters of phosphorous, organic phosphine oxides, amines, amino acids and chelate compounds onto (b) a porous, solid particulate inorganic substrate; adsorbing (c) a monomer selected from the group consisting of monovinyl compounds and mixtures thereof onto the substrate; and polymerizing the adsorbed monomer (c) by subjecting the monomer (c) to irradiation, thereby entrapping the liquid extractant (a) on substrate (b).

14. An immobilised extractant whenever prepared by the process of claim 12.

4,711,864

CATALYTIC CRACKING CATALYST

Regis J. Pellet, Croton-On-Hudson, and Richard J. Hinchey, Thornwood, both of N.Y., assignors to Union Carbide Corporation, Dandury, Conn.

Continuation of Ser. No. 500,446, Jun. 2, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 721,894

Int. Cl.[4] B01J *29/08*

U.S. Cl. 502—65 **20 Claims**

1. The zeolitic aluminosilicate having a mole ratio of oxide in the dehydrated state of:

$$0.85\text{-}1.1\ M_{2/n}O:Al_2O_3:XSiO_2$$

wherein M is a cation having valence "n"; "X" has a value greater than 6.0, has an X-ray powder diffraction pattern having at least the d-spacings of Table A; has extraneous silicon atoms in he crystal lattice in the form of framework SiO_4 tetrahedra; and has at least one Group IIIA cation per unit cell.

4. The zeolitic aluminosilicate of claim 1 wherein the Group IIIA cation is aluminum.

6. A catalyst for cracking hydrocarbons comprising between about 1 percent and about 99 percent by weight of an inorganic matrix and about 1 percent and about 99 percent by weight of the zeolitic aluminosilicate of claim 1.

7. The zeolitic aluminosilicate according to claim 1 wherein the aluminosilicate contains an effective amount of at least one multivalent cation selected from the group consisting of cerium, lanthanum, praseodymium, neodymium, promethium, samarium, europium, galodinium, terbium, dysprosium, hol-

mium, erbium, thulium, ytterbium, lutetium and mixtures thereof.

4,711,865
OLEFIN POLYMERIZATION CATALYSTS, PRODUCTION AND USE
Anthony N. Speca, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.
Filed Dec. 18, 1986, Ser. No. 944,306
Int. Cl.[4] C08F 4/62, 4/64, 4/68
U.S. Cl. 502—116 3 Claims

1. An olefin polymerization catalyst component obtained by

A. contacting in an inert hydrocarbon solvent an inorganic metal oxide catalyst support material of a Group IIa, IIIa, IVa, or IVb metal in finely divided form with

(a) an organometallic compound of a Group IIa, IIb, or IIIa metal and

(b) an oxygen containing compound selected from the Group consisting of alcohols, aldehydes, siloxanes, and ketones;

B. drying the contact product;

C. treating the dried contact product in an inert solvent with an acyl halide, at least one transition metal compound of a Group IVb, Vb, VIb, or VIII metal, and a halogen or interhalogen, and

D. treating with an organometallic compound of a Group IIa, IIb, or IIIa metal.

4,711,866
ADAMANTANE POLYMERIZATION CATALYST
Irving Kuntz, Linden, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.
Filed Feb. 5, 1986, Ser. No. 826,244
Int. Cl.[4] C08F 4/52, 4/14, 4/74
U.S. Cl. 502—152 9 Claims

1. A catalyst system for the preparation of isoolefin polymers and copolymers comprising a haloadamantane and Lewis acid wherein the haloadamantane is a bromo- or chloroadamantane.

4,711,867
CATALYTIC COMPOSITION
Masakatsu Hatano, Yokohama; Kazunori Oshima, Tokyo; Tatsuya Ihara, Kurashiki, and Kenichi Kiyono, Hachioji, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed Feb. 27, 1986, Ser. No. 833,279
Claims priority, application Japan, Mar. 7, 1985, 60-45186
Int. Cl.[4] B01J 21/02
U.S. Cl. 502—205 3 Claims

1. A catalyst composition for the production of acrylonitrile from propylene, ammonia and oxygen or an oxygen-containing gas of the formula:

$$(Mo)_a(W)_b(Bi)_c(Pb)_d(B)_e(Sb)_f(X)_g(O)_h$$

wherein X is chromium or iron; a, b, c, d,e, f, g and h respectively denote the number of atoms of molybdenum, tungsten, bismuth, lead, boron, antimony, element X and oxygen, wherein, given that $a+b=12$,

$0 \leqq b \leqq 7$,

$0.4 \leqq c \leqq 7$,

$2 \leqq d \leqq 12$,

$0.2/22 \leqq e/a \leqq 40/22$,

$0 \leqq f/a \leqq 25/22$,

$0 \leqq g/a \leqq 3/22$; and

h denotes the number of oxygen atoms necessary to satisfy the valencies of the remaining constituent elements of the catalyst.

4,711,868
PROCESS FOR PREPARING SILICA-ALUMINA
Yen-Shin Shyr, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 736,183, May 20, 1985, Pat. No. 4,617,108. This application May 23, 1986, Ser. No. 866,551
Int. Cl.[4] B01J 21/12
U.S. Cl. 502—235 22 Claims

12. A composition of matter prepared by the process comprising the steps of

(A) mixing a first aqueous solution consisting essentially of water, an aluminum salt and an ammonium salt of an acid having a pKa of less than 2 with a second aqueous solution containing an alkali metal silicate, wherein the mol ratio of the alkali metal silicate to the aluminum salt is in the range of from about 2:1 to about 20:1, and the amount of the ammonium salt in said first solution is such that a coprecipitated silica-alumina hydrogel is formed at a pH in the range of from about 3 to about 6 after said mixing;

(B) separating said coprecipitated silica-alumina hydrogel from the mixture of said first and second aqueous solutions; and

(C) calcining said coprecipitated silica-alumina hydrogel obtained in step (B) under such conditions as will result in the formation of an acidic silica-alumina.

20. A composition of matter in accordance with claim 12, wherein said process comprises the additional steps of

(E) impregnating the calcined silica-alumina obtained in step (C) with a solution containing at least one compound of at least one transition metal selected from metals belonging to Groups VB, VIB, VIIB, VIII and IB of the Periodic Table, and

(F) calcining said impregnated silica-alumina composition under such conditions as to convert said metal compounds to metal oxides.

4,711,869
SILICA-TITANIA HYDROCARBON CONVERSION CATALYST
Leonard A. Cullo, Greensburg, and Francis J. Shiring, III, Hampton Township, Alleghey County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.
Filed Nov. 8, 1985, Ser. No. 796,136
Int. Cl.[4] B01J 21/14, 21/06
U.S. Cl. 502—239 10 Claims

1. Method of making a catalyst useful in hydrocarbon conversion reactions comprising

(a) combining about one part of an aqueous sodium silicate solution containing about 12% to about 13% SiO_2, at a SiO_2 to Na_2O weight ratio of about 3.22 with about 0.94 parts of a second, clear aqueous solution of an organo-titanate chelate containing 0.18 to 0.32% titanium as TiO_2 and wherein the titanium has a coordination number of at least 5, 0.24 to 0.26 gram-equivalents per liter of a tetra-alkyl ammonium halide or hydroxide, up to 0.12 gram-equivalents per liter of a magnesium salt, and about 3.3 to about 3.5 gram-equivalents per liter of sodium chloride, to form a gel,

(b) crystallizing the gel by extended hydrothermal treatment,

(c) washing the crystallized gel,

(d) calcining the washed crystallized gel, and

(e) removing residual alkali metal therefrom.

4. A calcined crystalline titania-silica catalyst having a molar ratio of 0.015 to 0.04 TiO_2:1.0 SiO_2 and an X-ray diffraction pattern characterized by peaks as follows:

2θ	d (A)	I/Io × 100
7.75	11.39	49
8.30	10.64	13
8.70	10.16	100
13.70	6.46	13.

5. A calcined crystalline titania-magnesia-silica catalyst having molar ratios of 0.015 to 0.04 TiO_2:1.0 SiO_2 and 0.08 to 0.17 MgO, and an X-ray diffraction pattern characterized by peaks as follows:

2θ	d (A)	I/Io × 100
7.90	11.18	31
8.80	10.04	20
20.70	4.29	17
21.90	4.06	100.

4,711,870

EXHAUST GAS PURIFYING CATALYST

Chikara Yamada, Higashimurayama; Yoji Watabe, Hachioji; Koichi Irako, deceased, late of Higashimurayama by Sanae Irako, legal heir, and Yuichi Murakamai, Nagoya, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 25, 1986, Ser. No. 855,943

Claims priority, application Japan, Apr. 27, 1985, 60-92072; Dec. 13, 1985, 60-279219

Int. Cl.⁴ B01J *21/04, 23/10, 23/22, 23/72*

U.S. Cl. 502—303 **11 Claims**

1. A catalyst suitable for assisting in purifying exhaust gases consisting essentially of

(a) at least one member selected from the group consisting of copper and copper compounds;

(b) at least one member selected from the group consisting of vanadium and vanadium compounds; and

(c) at least one member selected from the group consisting of zirconium, aluminum, iron, lanthanum, lead, cerium and compounds thereof.

4,711,871

CATALYSTS COMPRISING RUTHENIUM ON TITANIA SURFACE MODIFIED WITH GROUP VA OXIDE OF VANADIUM, NIOBIUM OR TANTALUM

Israel E. Wachs, Bridgewater, N.J., and Darchun B. Yang, Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 626,457, Jun. 29, 1984, abandoned. This application Dec. 11, 1985, Ser. No. 808,008

Int. Cl.⁴ B01J *21/06, 23/46, 23/64*

U.S. Cl. 502—325 **6 Claims**

1. A process for preparing a catalyst comprising ruthenium supported on a surface-modified titania support wherein said support comprises an oxide of a metal selected from the group consisting of niobium, vanadium, tantalum or mixture thereof, in a non-crystalline form, supported on said titania wherein said process comprises the sequential steps of:

(a) forming said support comprising titania whose surface has been modified with and supports an oxide of a metal selected from the group consisting of niobium, tantalum, vanadium or mixture thereof wherein said supported, modifying oxide is a non-crystalline form;

(b) impregnating said so-formed surface modified titania support with a solution of a ruthenium precursor compound; and,

(c) converting said ruthenium precursor compound to ruthenium to form said catalyst.

4,711,872

CATALYST FOR COMBUSTION AND PROCESS FOR PRODUCING SAME

Yasuyoshi Kato; Nobue Teshima, both of Kure; Masao Ohta, Hiroshima, and Kunihiko Konishi, Kure, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Japan

Filed Apr. 24, 1986, Ser. No. 855,484

Claims priority, application Japan, Apr. 25, 1985, 60-89196

Int. Cl.⁴ B01J *21/04, 23/58*

U.S. Cl. 502—328 **6 Claims**

1. A catalyst for combustion comprising a compound expressed by a composition formula $BaAl_{12}O_{19}$ having Pd supported thereon.

4,711,873

PROCESS FOR PREPARING SOLID BASE CATALYST

Gohfu Suzukamo, Ibaraki; Masami Fukao, Shiga; Masao Minobe, Nilhama, and Akemi Sakamoto, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 15, 1986, Ser. No. 896,951

Claims priority, application Japan, Aug. 16, 1985, 60-180869; Nov. 12, 1985, 60-253568

Int. Cl.⁴ B01J *21/04, 23/04*

U.S. Cl. 502—344 **16 Claims**

1. A process for preparing a solid base which comprises reacting alumina with an alkali metal hydroxide in a reaction system at a temperature of from 200° to 500° C. to form a reaction product; adding an alkali metal to the reaction system; and reacting the reaction product with the added alkali metal at a temperature of from 180° to 350° C. or reacting water-containing alumina with an alkali metal in such an amount that corresponds to a molar equivalent of water contained in the alumina in a reaction system at a temperature in a range between the melting point of the alkali metal and 500° C. to form a reaction product; adding an alkali metal to the reaction system; and reacting the reaction product with the added alkali metal in such an amount that the total amount of alkali metal corresponds to 1.01 to 2 times molar equivalent of water contained in the water-containing alumina, at a temperature of from 180° to 350° C., to form the solid base.

4,711,874

THERMOSENSITIVE RECORDING ADHESIVE SHEET

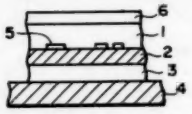
Yukihiro Yuyama; Takanori Motosugi; Yasuhiro Honda, and Akira Ichikawa, all of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,432

Claims priority, application Japan, Aug. 20, 1984, 59-126089[U]; Dec. 20, 1984, 59-193475[U]

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—206 **9 Claims**



1. In a thermosensitive recording adhesive sheet capable of forming colored images thereon upon application of heat, comprising:

(a) a support material,

(b) a thermosensitive coloring layer formed on said support material,

(c) an adhesive layer formed on the back side of said support material, opposite to the thermosensitive coloring layer, the

(d) a disposable backing sheet which is attached to said adhesive layer and can be peeled off said adhesive layer when said thermosensitive recording adhesive label is

used, the improvement which comprises preprinted print patterns located solely on one side of said support material, and said preprinted print patterns are visible through said thermosensitive coloring layer.

4,711,875

COMPOSITION ESSENTIALLY CONSISTING OF TRANS-1-(2,6,6-TRIMETHYLCYCLOHEXYL)-HEXAN-3-OL

Karl-Heinrich Schulte-Elte, Onex; Günther Ohloff, Bernex; Bernard L. Müller, Geneva, and Wolfgang K. Giersch, Bernex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 584,501, Feb. 28, 1984, Pat. No. 4,623,750. This application Oct. 17, 1985, Ser. No. 788,314

Claims priority, application Switzerland, Mar. 9, 1983, 1259/83

Int. Cl.[4] A61K *7/46*; C07C *35/08*

U.S. Cl. 512—1 12 Claims

1. A perfume composition comprising an odorous effective amount of an odorous composition containing from 50% to 100% of trans-1-(2,6,6-trimethylcyclohexyl)hexan-3-ol- and not more than 50% of cis-1-(2,6,6-trimethylcyclohexyl)hexan-3-ol.

4,711,876

PROCESS FOR THE TREATMENT AND REMISSION OF AIDS (ACQUIRED IMMUNE DEFICIENCY SYNDROME)

Salvatore J. Catapano, 66 S. Brush Dr., Valley Stream, N.Y. 11581

Filed Dec. 5, 1985, Ser. No. 804,858

Int. Cl.[4] A61K *39/00, 39/02*

U.S. Cl. 514—2 6 Claims

1. A method of treating a human patient to effect the remission of symptoms associated with AIDS, which comprises parenterally administering, in multiple injections, to the patient in need of such treatment typhoid vaccine in a therapeutically effective amount which is sufficient to provide immunostimulating activity.

4,711,877

6-PEN-VASOPRESSIN COMPOUNDS

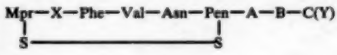
Michael L. Moore, Media, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Sep. 18, 1985, Ser. No. 777,385

Int. Cl.[4] A61K *37/34*; C07K *7/16*

U.S. Cl. 514—11 15 Claims

1. A polypeptide compound having the formula:



in which:

X is a D or L isomer of Ile, Phe(Alk), Tyr or Tyr(Alk);

A is Pro or a single bond;

B is a D or L isomer of Arg or Lys;

C is a D or L isomer of Arg, Lys or Gly or a single bond; and

Y is OH or NH_2, or a pharmaceutically acceptable salt or ester prodrug thereof.

4,711,878

NOVEL PEPTIDES AND PROCESSES FOR PREPARING THE SAME

Hiroshi Sugano, Nara; Ryuichi Ishida, Suita, and Michio Yamamura, Tondabayashi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

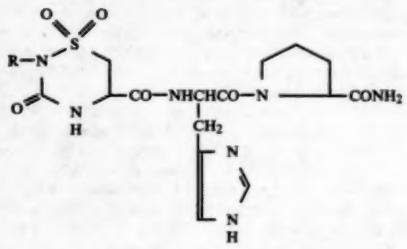
Filed Feb. 5, 1986, Ser. No. 826,265

Claims priority, application United Kingdom, Feb. 20, 1985, 8504357

Int. Cl.[4] A61K *37/24*; C07K *7/02, 5/08*

U.S. Cl. 514—18 8 Claims

1. A compound of the formula:



wherein R is hydrogen or a lower alkyl group, or a pharmaceutically acceptable salt thereof.

4,711,879

ACYLATED SUGAR DERIVATIVES, PROCESSES FOR THEIR MANUFACTURE, AND THEIR USE

Gerhard Baschang, Bettingen, Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany, and Oskar Wacker, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 739,269, May 29, 1985, Pat. No. 4,640,911. This application Nov. 7, 1986, Ser. No. 928,493

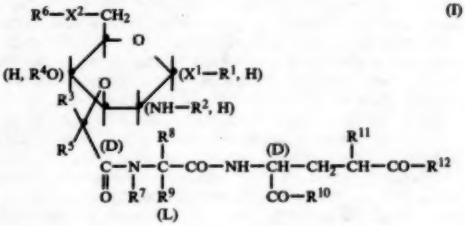
Claims priority, application Switzerland, May 29, 1984, 2635/84

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

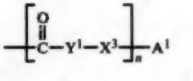
Int. Cl.[4] A61K *31/70*; C08G *18/08*

U.S. Cl. 514—42 25 Claims

1. A sugar derivative of the formula I

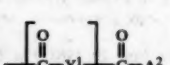


in which the sugar moiety is derived from D-glucose, D-mannose or D-galactose; X^1 represents oxygen, sulphur or the group NH; X^2 represents oxygen or the group NH; R^1, R^4 and R^6 each represents, independently of the others, (a) hydrogen, (b) lower alkanoyl, (c) a radical of the formula Ia,



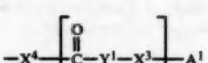
in which n represents 0 or 1; Y^1 represents alkylene having up

to an including 18 carbon atoms which may be interrupted by carbonylimino or carbonyloxy and which is unsubstituted or substituted by at least one substituent selected from carboxy, benzyloxycarbonyl, lower alkoxycarbonyl, amino, lower alkanoylamino, hydroxy and lower alkanoyloxy; X^3 represents oxygen or the group NH; and A^1 represents the acyl radical of a carboxylic acid selected from the group consisting of 6-chloro-5-cyclohexylindan-1-carboxylic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazxol-2-yl]-propionic acid, 2-(5-chloro-4-cyclohexyl-2-hydroxyphenyl)-acetic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazol-2-yl]-2-methyl-propionic acid, 2-(3-fluoro-4-pheylphenyl)-propionic acid, (±)-5-benzoyl-3H-1,2-dihydro-pyrrolo [a]pyrrole-1-carboxylic acid, 2-[4-(1,3-dihydro-1-oxo-2H-isoindol-2-yl)-phenyl]-propionic acid, 2-{2-[(2,6-dichlorophenyl)-amino]-phenyl}-acetic acid, 2-{2-[(2,6-dichloro-4-fluorophenyl)-amino]-5-fluorophenyl}-acetic acid, 2-(2,3-dimethylphenyl)-aminobenzxoic acid, 2-[4,5-bis-(4-methoxyphenyl)-imidazxol-2-yl]-2-methylpropionic acid, 2-{2-[(2,6-dichlorophenyl)-amino]-5-fluorophenyl}-acetic acid, 2-(3-benzxoylphenyl)propionic acid, 2-S-[4,5-bis-(4-methoxyphenyl)-thiazol-2-yl]merceptoacetic acid, 3-S-[4,5-bis-(4-methoxyphenyl)-thiazol-2-yl]-mercaptopropionic acid, 2-{2-[(2,6-dichloro-4-fluoropheyl)-amino]-phenyl}-acetic acid, 5-(2,4-difluorophenyl)-2-hydroxybenzoic acid, 2-(6-chloro-9H-carbaszxol-2-yl)-propionic acid, 2-(4-isobutylphenyl)-propionic acid, 1-(4-chlorobenzoyl)-5-methoxy-2-methylindol-3-ylacetic acid, 2-(6-methoxynaphth-2-yl)-propionic acid, 2-[3-chloro-4-(3-pyrrolin-1-yl)-phenyl]-propionic acid, 2-(5H-[1]benzopyrano[2,3-b]-pyridin-7-yl)-propionic acid, 5-(4-methylbenzoyl)-1-methylpyrrol-2-ylacetic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazol-2-yl]-acetic acid, 1-benzoyl-5-methoxy-2-methylindol-3-ylacetic acid, 2-[3-(hydroxybenzxyl)-phenyl]-propionic acid and 2-[3-chloro-4-(pyrrol-1-yl)-phenyl]-propionic acid, or (d) radical of the formula Ib

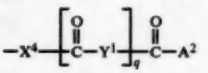


(Ib)

in which n and Y^1 have the meanings mentioned above and A^2 represents lower alkoxy selected from the group consisting of 2-[4,5-bis-(4-methoxyphenyl)-thiazol-2-ylthiol]-ethoxy, 2-[4,5-bis-(4-methoxyphenyl)-imidazol-2-yl]-2-methylpropoxy and 3-[4,5-bis-(4-methoxyphenyl)-thiazol-2-ylthio]-propoxy; or R^1 alternatively represents benzyl which is unsubstituted or substituted in the phenyl moiety by lower alkyl, hydroxy, lower alkoxy or halogen; R^2 represents unsubstituted or hydroxy-substituted lower alkanoyl, benzoyl which is unsubstituted or substituted by at least one substituent selected from lower alkyl, lower alakoxy, halogen, lower alkanoyloxy and lower alkanoylamino, or R^2 represents one of the above-mentioned radicals of the formulae Ia and Ib; R^3 represents hydrogen or lower allkyl and R^5 represents hydrogen, or R^3 and R^5 together represent lower alkylidene, unsubstituted benzylidene or benzxylidene the phenyl radical of which is halogenated or substituted by lower alkyl; R^7 represents hydrogen or lower alkyl, or R^7 and R^9 together represents trimethylene; R^8 represents hydrogen or lower alkyl; R^9 represents hydrogen or lower alkyl that is unsubstituted or substituted by hydroxy, mercapto, lower alkylthio, carboxy, lower alkoxycarbonyl, carbamoyl, or by a radical of the formula Ic, Id, Ie or If

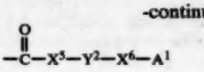


(Ic)

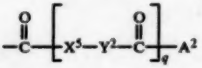


(Id)

-continued

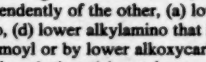


(Ie)



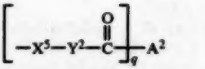
(If)

in which q represents 0 or 1; X^4 represents oxygen or sulphur; and X^5 and X^6 each represents, independently of the other, oxygen or the group NH; Y^2 represents alkylene having up to and including 18 carbon atoms in which a methylene group may have been replaced by oxygen, sulphur or sulphinyl or which may be interrupted by carbonylimino or carbonyloxy, said alkylene radical Y^2 being unsubstituted or substituted by at least one substituent selected from carboxy, benzyloxycarbonyl, lower alkoxycarbonyl, amino, lower alkanoylamino, hydroxy and lower alkanoyloxy, and the other substituents have the meanings mentioned above; R^{10} and R^{12} each represents, independently of the other, (a) lower alkoxy, (b) hydroxy, (c) amino, (d) lower alkylamino that is substituted by carboxy, by carbamoyl or by lower alkoxycarbonyl and that may be additionally substituted by at least one substituent selected from amino, hydroxy, carboxy, 2-aminomethylthio, 2-aminoethoxy and the sulpho group —SO_3H, (e) a radical of the formula Ig,



(Ig)

in which the substituents have the meanings mentioned above, or (f) a radical of the formula Ih,



(Ih)

in which q, X^5, Y^2 and A^2 have the meanings mentioned above; and R^{11} represents hydrogen, carboxy, lower alkoxycarbonyl or carbamoyl, said compound of the formula I having a minimum of one and a maximum of three radicals selected from A^1 and A^2, or a pharmaceutically acceptable salt of such a compound having at least one salt-forming group.

4,711,880
CRYSTALLINE DISODIUM 3-AMINO-1-HYDROXYPROPANE-1,1-DIPHOSPHONATE PENTAHYDRATE

Peter H. Stahl, Freiburg, Fed. Rep. of Germany, and Beat Schmitz, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

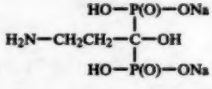
Division of Ser. No. 759,985, Jul. 29, 1985, Pat. No. 4,639,338. This application Sep. 8, 1986, Ser. No. 905,097

Claims priority, application Switzerland, Aug. 6, 1984, 3768/84

Int. Cl.[4] A61K *31/045, 31/66;* **C07F** *9/38*

U.S. Cl. 514—108 **9 Claims**

1. Disodium 3-amino-1-hydroxypropane-1,1-diphosphonate of the formula



(I)

in a crystalline form that contains water of crystallisation.

9. Pharmaceutical preparations intended for enteral administration to warm-blooded animals, containing disodium 3-amino-1-hydroxypropane-1,1-diphosphonate in addition to

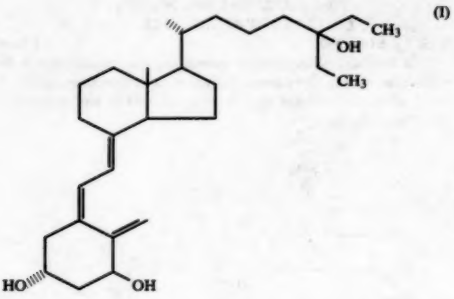
customary pharmaceutical auxiliaries, characterised in that they contain the mentioned active ingredient in a crystalline form that contains water of crystallisation according to claim 1.

4,711,881
1α,25-DIHYDROXY-26,27-DIMETHYLCHOLECALCIFEROL AND ITS USE IN THE TREATMENT OF CALCIUM PATHOBOLISM

Nobuo Ikekawa, Musashino, Japan, assignor to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1985, Ser. No. 763,568
Claims priority, application Japan, Aug. 10, 1984, 59-167552
Int. Cl.⁴ A61K *31/59; C07J 9/00*
U.S. Cl. 514—167 **3 Claims**

1. 1α,25-Dihydroxy-26,27-dimethylcholecalciferol represented by formula:



(I)

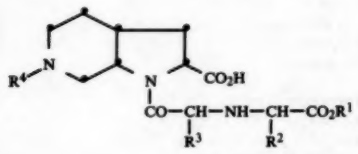
3. A method for the prevention or treatment of calcium pathobolism or osteoporosis, which comprises administering to a mammal an effective amount of 1α,25-dihydroxy-26,27-dimethylcholecalciferol.

4,711,882
OCTAHYDRO-6-AZAINDOLE COMPOUNDS, COMPOSITIONS AND USE

Simon F. Campbell, Deal, and Ryszard J. Kobylecki, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

Filed Dec. 19, 1985, Ser. No. 811,253
Claims priority, application United Kingdom, Dec. 21, 1984, 8432532; Jun. 10, 1985, 8514634
Int. Cl.⁴ A61K *31/435, 31/535;* **C07D** *471/04*
U.S. Cl. 514—228 **20 Claims**

1. An octahydro-6-azaindole dipeptide derivative of the formula:



or a pharmaceutically acceptable salt thereof, wherein:

R^1 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl or aryl-(C_1–C_4 alkyl);

R^2 is C_1–C_6 alkyl, C_2–C_6 alkenyl, C_3–C_7 cycloalkyl or substituted C_1–C_6 alkyl in which the substituent is halogen, hydroxy, C_1–C_6 alkoxy, aryl, aryloxy, aryl-(C_1–C_4 alkoxy), C_1–C_4 alkylthio, arylthio, aryl-(C_1–C_4 alkyl)thio, C_3–C_7 cycloalkyl, $—NR^5R^6$, $—NHCOR^5$, $—NHCOOR^7$, guanidino or a heterocyclyl group;

R^3 is C_1–C_6 alkyl, C_3–C_7 cycloalkyl or substituted C_1–C_6 alkyl in which the substituent is halogen, hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_3–C_7 cycloalkyl, $—NR^5R^6$, $—NHCOR^5$, $—NHCOOR^7$, $—COOH$, $—COO(C_1$–C_4 alkyl), $—CONR^5R^6$, guanidino, aryl or a heterocyclyl group; and

R^4 is $—SO_2R^7$ or $—SO_2NR^5R^6$, wherein

R^5 and R^6 are each independently hydrogen, C_1–C_6 alkyl, C_3–C_7 cycloalkyl, aryl, heterocyclyl or a substituted C_1–C_6 alkyl group in which the alkyl group is substituted by one or more halogen atoms or an hydroxy or a C_3–C_7 cycloalkyl, aryl, heterocyclyl or $—NR^8R^9$ group wherein R^8 and R^9 are each independently hydrogen, C_1–C_4 alkyl, $—CO(C_1$–C_4 alkyl) or aryl; and

R^7 is C_1–C_6 alkyl, C_3–C_7 cycloalkyl, aryl, heterocyclyl or a substituted C_1–C_6 alkyl group in which the alkyl group is substituted by one or more halogen atoms or an hydroxy or a C_3–C_7 cycloalkyl, aryl, heterocyclyl or $—NR^8R^9$ group;

said aryl groups in the definition of R^1, R^2, R^3 and R^4 having up to ten carbon atoms in the nuclear ring; and

said heterocyclyl groups in the definition of R^2, R^3 and R^4 being pyridyl, furyl, thienyl, benzothienyl, indolyl, imidazolyl, thiazolyl, pyrrolidinyl, piperidino, morpholino or piperazinyl, with said groups being optionally substituted with halogen, hydroxy, oxo, C_1–C_4 alkyl, carbamoyl, amino or mono- or di-(C_1–C_4 alkyl)amino groups.

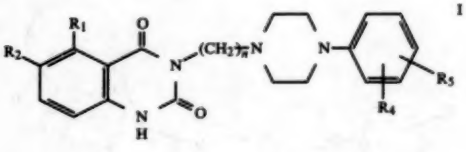
19. A pharmaceutical composition suitable for oral or parenteral administration comprising a pharmaceutically acceptable carrier and an effective antihypertensive amount of a compound of a compound as claimed in claim 1.

4,711,883
SUBSTITUTED 3-(4-PHENYL-1-PIPERAZINYL)ALKYLQUINAZOLIN-2,4-(1H,3H) DIONES, METHODS OF PREPARATION, COMPOSITIONS AND METHOD OF USE

Victor T. Bandurco, Bridgewater; Charles F. Schwender, Califon; Robert Falotico, Belle Mead, all of N.J., and Alfonso J. Tobia, Doylestown, Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 30, 1985, Ser. No. 782,241
Int. Cl.⁴ A61K *31/505;* **C07D** *403/06*
U.S. Cl. 514—253 **12 Claims**

12. A method of treating hypertension, which comprises administering an effective antihypertensive amount in a pharmaceutically acceptable carrier of a compound of the formula



I

wherein

R_1 is hydroxy or alkoxy having 1–4 carbon atoms:

R_2 is hydroxy or alkoxy having 1–4 carbon atoms: or when R_1 or R_2 are taken together they are loweralkylenedioxy:

n is an integer from 2 to 6;

R_4 and R_5 are the same or different and are hydrogen, hydroxy, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, halo, or trifluoromethyl, or when R_4 and R_5 are taken together they are lower alkylenedioxy;

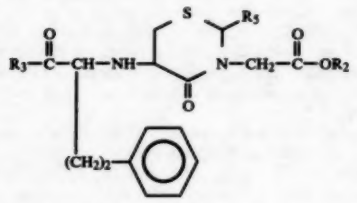
or the pharmaceutically acceptable salts thereof.

4,711,884
THIAZINE AND THIAZEPINE CONTAINING COMPOUNDS

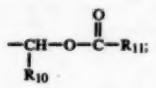
Donald S. Karanewsky, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 470,882, Feb. 28, 1983, Pat. No. 4,460,579. This application Dec. 27, 1983, Ser. No. 565,498
Int. Cl.[4] C07D *279/06, 281/02;* A61K *31/54, 31/55*
U.S. Cl. 514—226 6 Claims

1. A compound of the formula:



and a pharmacuetically acceptable salt salt thereof wherein:
R_3 is hydroxy, ethyoxy, or -O-alkali metal salt ion;
R_5 is hydrogen or phenyl;
R_2 is hydrogen, alkali metal salt ion, or



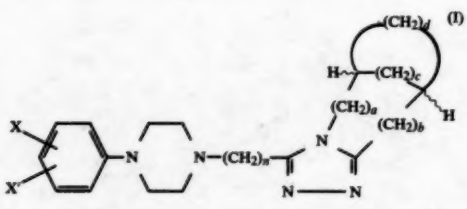
R_{10} is hydrogen, straight or branched chain lower alkyl of 1 to 4 carbons, or cyclohexyl; and
R_{11} is straignt or branched chain lower alkyl of 1 to 4 carbons.

4,711,885
N-(N'-PHENYLPIPERAZINE)-ALKYL TRIAZOLE COMPOUNDS HAVING ANXIOLYTIC AND ANALGESIC PROPERTIES

Michel Wierzbicki, Puteaux; Pierre Hugon, Rueil Malmaison, and Jean-Claude Poignant, Bures S/Yvette, all of France, assignors to Adir et Compagnie, Neuilly-sur-Seine, France

Filed Apr. 1, 1986, Ser. No. 846,911
Claims priority, application France, Apr. 17, 1985, 85 05762
Int. Cl.[4] A61K *31/495;* C07D *403/14, 401/14*
U.S. Cl. 514—253 10 Claims

1. A compound selected from the group consisting of: triazole compounds of the formula:



(I)

in which:
X and X', which are the same or different, are each selected from the group consisting of hydrogen, halogen, trifluoromethyl, and alkyl and alkoxy each having from 1 to 5 carbon atoms inclusive, and
X and X' together represent methylenedioxy,
n is selected from the group consisting of integers of from 1 to 6,
a is selected from the group consisting of 0, 1 and 2,
b is selected from the group consisting of 0, 1, 2 and 3,
c is selected from the group consisting of 0, 1 and 2, and
d is selected from the group consisting of 2, 3, 4 and 5 such that the sum of a+b+c+d is equal to 4, 5, 6 or 7, and
physiologically tolerable acid addition salts thereof.

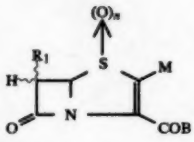
10. A method for treating a living animal body afflicted with pain or anxiety comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

4,711,886
β-LACTAM DERIVATIVES AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

Paul E. Finke, Milltown; James B. Doherty, New Milford; Morris Zimmerman, Watchung; Bonnie M. Ashe, Scotch Plains, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 2, 1984, Ser. No. 627,166
Int. Cl.[4] C07D *499/00;* A61K *31/425*
U.S. Cl. 514—195 6 Claims

1. A method of treating or managing elastase-mediated diseases comprising the administration to a mammalian species in need of such treatment an effective amount of a compound of structural formula:



(I)

wherein
M is:
(1) —OR wherein R is as defined below;
(2) —SR;
(3) —SOR;
(4) $—SO_2R$;
(5) —COOR;
(6) —OCOR;
(7) phenyl;
(8) $—CH_2A$ wherein A represents:
(a) hydrogen;
(b) C_{1-6}alkyl;
(c) phenyl;
(d) OR;
(e) halo;
(f) OCOR;
(g) SR or $S(CS)OR_a$ wherein R_a is C_{1-6}alkyl or H;
(h) SCOR;
(i) CH_2NHCHO;
(j) CH_2N_3;
(k) CH_2NH_2; or
(l) CH_2OH;
(9) hydrogen;
R is:
(a) hydrogen;
(b) C_{1-6}alkyl;
(c) phenyl;
(d) $—CH_2CH_2NH_2$;
(e) $—CH_2CH_2NHCOOCH_3$;
(f) $—CH_2CH_2OCH_3$;
(g) tetrazolyl; or
(h) $C_6H_5CH_2—$;
R_1 is:
(1) hydrogen;
(2) C_{1-6}alkyl;
(3) OR;
(4) SR;
(5) C_{1-6}hydroxyalkyl;
(6) C_{1-6}alkoxycvasrbonyl-C_{1-6}alkyl;

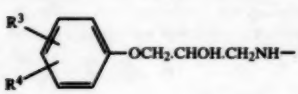
(7) C_{1-6}alkoxycarbonyloxy-C_{1-6}alkyl;
(8) benzoycarbonyloxy-C_{1-6}alkyl; or
(9) phenoxycarbonyloxy-C_{1-6}alkyl;
B is OB_1 or NB_2B_3 wherein B_1 and B_2 independently are
(1) benzyl;
(2) phenyl;
(3) straight or branched C_{1-6}alkyl;
(4) straight or branched C_{2-8}alkenyl;
(5) C_{3-8}cycloalkyl;
(6) C_{1-6}alkanoyloxy C_{1-6}alkyl;
(7) C_{1-6}alkanoyl C_{1-6}alkyl;
(8) C_{1-6}alkoxy C_{1-6}alkyl; or
(9) halo-C_{1-6}alkyl;
the above groups (1)–(9) can optionally be substituted by radicals selected from a group consisting of C_{1-6}alkyl, hydroxy, C_{1-6}alkoxy, halo, nitro, mercapto, amino, cyano, carboxy, sulfoamino, carbamoyl, carbamoyloxy C_{1-6}alkyl or amino sulfonyl, C_{1-6}alkylamino, sulfamoyl, azido, carboxamido or N-C_{1-6}alkylcarboxamido: n is 0, 1 or 2.

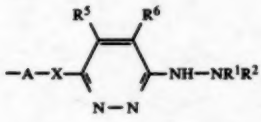
4,711,887
HYDRAZINOPYRIDAZINE COMPOUNDS

Malcolm T. Briggs, Macclesfield; Robert I. Dowell, Congleton, and Craig W. Thornber, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 28, 1983, Ser. No. 479,913
Claims priority, application United Kingdom, Apr. 23, 1982, 8211760
Int. Cl.[4] C07D *237/20;* A61K *31/50*
U.S. Cl. 514—247 10 Claims

1. A compound of the formula:





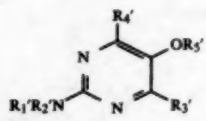
wherein A stands for an alkylene radical of from 2 to 6 carbon atoms, wherein either R^1 stands for hydrogen and R^2 stands for hydrogen or for an alkoxycarbonyl radical of from 2 to 6 carbon atoms or an aralkoxycarbonyl radical of from 8 to 12 carbon atoms, or R^1 and R^2 together form an alkylidene radical of from 2 to 6 carbon atoms or an aralkylidene radical of from 7 to 12 carbon atoms, or an alkoxycarbonyl or aralkoxycarbonyl-alkylidene radical of, respectively, from 4 to 10 or from 9 to 15 carbon atoms; wherein R^3 and R^4, which may be the same or different, each stands for a hydrogen or halogen atom, a hydroxy, amino, nitro, trifluoromethyl, carbamoyl or cyano radical, an alkyl, hydroxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl radical each of up to 6 carbon atoms, or an aryl, aryloxy or dialkylamino radical each of up to 12 carbon atoms; or wherein R^3 and R^4 together form the trimethylene, tetramethylene, 1-oxotetramethylene, propylene, but-2-enylene or buta-1,3-dienylene radical such that together with the adjacent benzene ring they form respectively the indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl radical; wherein R^5 and R^6, which may be the same or different, each stands for a hydrogen atom or for an alkyl radical of up to 6 carbon atoms, or wherein R^5 and R^6 together form the buta-1,3-dienylene radical such that together with the adjacent pyridazine ring they form the phthalazinyl radical; and wherein X stands for the oxygen atom; or an acid-addition salt thereof.

4,711,888
HYDROXY AND ALKOXY PYRIMIDINES

Frederick J. Walker, Groton, and John L. LaMattina, Ledyard, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 24, 1985, Ser. No. 758,199
Int. Cl.[4] A61K *31/505;* C07D *239/47, 401/04*
U.S. Cl. 514—269 17 Claims

13. A composition for the treatment of pulmonary, asthmatic, allergic or inflammatory diseases which comprises a compound of the formula



I'

wherein R_1' is hydrogen or (C_1–C_{15})alkyl; R_2' is hydrogen, (C_1–C_{15})alkyl, cyclopentyl, cyclohexyl, (C_3–C_{15})alkenyl, phenyl, or (C_7–C_{20})phenylalkyl which may be substituted in the phenyl by one or two of fluoro, chloro, (C_1–C_3) alkyl, (C_1–C_3) alkoxy, or CF_3; or R_1' and R_2' together with the nitrogen atom to which they are attached form a pyrrolidinyl or piperidyl which may be substituted by one (C_1–C_6)alkyl, phenyl, or (C_7–C_{20})phenylalkyl; R_3' is (C_1–C_6)alkyl, phenyl, (C_7–C_{20})phenylalkyl which may be substituted in the phenyl group by one or two fluoro, chloro, (C_1–C_3)alkyl, (C_1–C_3)alkoxy, or CF_3, or furyl or thienyl which may be substituted by one (C_1–C_3)alkyl; R_4' is hydrogen, (C_1–C_6)alkyl, phenyl or (C_7–C_{20})phenylalkyl which may be substituted in the phenyl group by one or two fluoro, chloro, (C_1–C_3)alkyl, (C_1–C_3)alkoxy or CF_3; and R_5' is hydrogen, (C_1–C_6)alkyl, or (C_7–C_{20})-phenylalkyl which may be substituted in the phenyl group by one to three of fluoro, chloro, (C_1–C_3)alkyl, (C_1–C_3)alkoxy or CF_3; with the proviso that when R_4' and R_5' are each hydrogen then R_3' is not (C_1–C_6)alkyl;

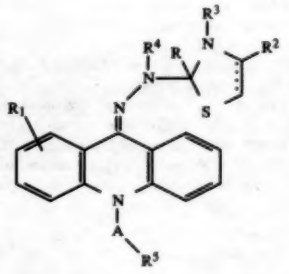
or a pharmaceutically acceptable acid salt thereof or, when R_5' is hydrogen, a pharmaceutically acceptable base addition salt thereof, in an amount effective for the treatment of said diseases, in admixture with a pharmaceutically acceptable carrier.

4,711,889
SCHISTOSOMICIDAL ACRIDANONE HYDRAZONES

Urs Brombacher, Riehen; Helmut Link, and Marc Montavon, both of Basel, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 551,808, Nov. 15, 1983, abandoned.
This application Jul. 18, 1986, Ser. No. 887,580
Int. Cl.[4] A61K *31/47;* C07D *219/10*
U.S. Cl. 514—297 34 Claims

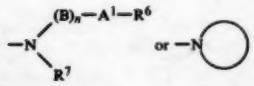
1. A compound of the formula



I

wherein the dotted line is an optional bond,
R^1 is hydrogen,
halogen or nitro,

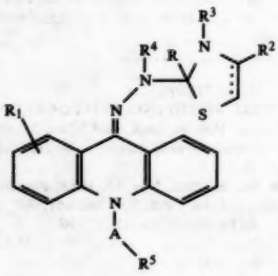
R^2 is hydrogen or lower alkyl,
one of R^3 and R^4 is hydrogen or lower alkyl and the other together with R is an additional bond,
A is lower alkylene,
R^5 is a 5-membered, optionally lower alkyl-substituted aromatic heterocycle, containing one or two nitrogen atoms or one nitrogen atom and an oxygen or sulfur atom linked with group A via a carbon atom or via a nitrogen of the heterocycle, amino or the group



the symbol

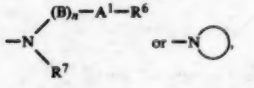
is an unsubstituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$; or a lower-alkyl substituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$ wherein B is —CO—, —COO— or $-SO_2-$, n is the integer 0 or 1, A^1 is lower alkylene, R^6 is hydrogen, amino, lower alkyl-amino or di(lower alkyl) amino and R^7 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

25. A schistosomicidal composition comprising a schistosomicidally effective amount of a compound of the formula



I

wherein the dotted line is an optional bond,
R^1 is hydrogen, halogen or nitro,
R^2 is hydrogen or lower alkyl,
one of R^3 and R^4 is hydrogen or lower alkyl and the other together with R is an additional bond,
A is lower alkylene, R^5 is a 5-membered, optionally lower alkyl-substituted aromatic heterocycle, containing one or two nitrogen atoms or one nitrogen atom and an oxygen or sulfur atom linked with group A via a carbon atom or via a nitrogen of the heterocycle, amino or the group



the symbol

is an unsubstituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$; or a lower-alkyl substituted heterocycle selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholino, 1-piperazinyl and 1-piperazinyl substituted on the second nitrogen atom by the group $-(B)_n-A^1-R^6$ wherein B is —CO—, —COO— or $-SO_2-$, n is the integer 0 or 1, A^1 is lower alkylene, R^6 is hydrogen, amino, lower alkyl-amino or di(lower alkyl) amino and R^7 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof, and an inert pharmaceutical carrier.

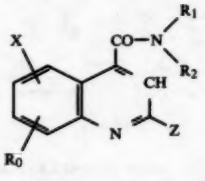
4,711,890

PHARMACEUTICAL COMPOSITIONS CONTAINING AZANAPHTHALENE-CARBOXAMIDE DERIVATIVES, AZANAPHTHALENE-CARBOXAMIDE DERIVATIVES AND PROCESS FOR THEIR USE

Marie-Christine Dubroeucq, Enghien-les-Bains; Gerard R. Le Fur, Le Plessis-Robinson, and Christian L. A. Renault, Taverny, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

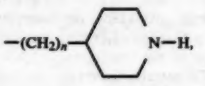
Filed Dec. 22, 1983, Ser. No. 564,322
Claims priority, application France, Dec. 24, 1982, 82 21758
Int. Cl.[4] A61K *31/47*; C07D *215/22*
U.S. Cl. 514—311 **12 Claims**

1. A pharmaceutical composition useful in the treatment of anxiety states or of pulmonary, renal, circulatory or cardiovascular disorders, which comprises as active ingredient, an effective amount of a compound of the formula:



(I)

in which R_1 represents a linear or branched alkyl group having 1 to 6 carbon atoms, a phenyl group, a cycloalkyl group having 3 to 6 carbon atoms, a phenylalkyl group, the alkyl moiety of which has 1 to 3 carbon atoms, a cycloalkyl-alkyl group, the cycloalkyl moiety of which has 3 to 6 carbon atoms and the alkyl moiety of which has 1 to 3 carbon atoms, R_2 represents a linear or branched alkyl group having 1 to 6 carbon atoms, a phenyl group, a cycloalkyl group having 3 to 6 carbon atoms, a phenylalkyl group, the alkyl moiety of which has 1 to 3 carbon atoms, a cycloalkyl-alkyl group, the cycloalkyl moiety of which has 3 to 6 carbon atoms and the alkyl moiety of which has 1 to 3 carbon atoms or a



in which n is 0, 1, 2 or 3, or R_1 and R_2 together with the nitrogen atom to which they are attached represent a pyrrolidinyl, piperidino, 4-oxopiperidino or piperidino group substituted by one or two alkyl groups having 1 to 3 carbon atoms, by a hydroxyl group in the 3- or 4-position or by hydroxyalkyl, dimethylaminoalkyl or diethylaminoalkyl groups, the alkyl

moiety of which has 1 to 3 carbon atoms, Z represents a phenyl, pyridinyl, thienyl or thiazol-2-yl group or a phenyl group substituted by one or two substituents selected from amongst halogen atoms, alkyl, alkoxy and alkylthio groups having 1 to 3 carbon atoms, the trifluoromethyl group and the nitro group, X and R_0 are identical or different and represent hydrogen atoms or halogen atoms, alkyl or alkoxy groups having 1 to 3 carbon atoms or nitro or trifluoromethyl groups, with the exception of a said compound in which Z represents a phenyl group, the

is N,N-diethyl and X and R_0 both represent hydrogen atoms, or a stereoisomer or mixture of stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof, in association with a pharmaceutically acceptable carrier or coating.

4,711,891

USE OF TERGURIDE AS A GERIATRIC AGENT

Bernd Aufdembrinke; Rainer Dorow; Reinhard Horowski; Irmgard Suchy; Gertrud Schroeder; Helmut Wachtel; Wolfgang Kehr, and Günter Stock, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,779

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522894

Int. Cl.[4] A61V *31/47*

U.S. Cl. 514—313 **27 Claims**

1. A method of treating a cognition decline or a decline or disturbance in motor function or vigilance in a geriatric patient comprising administering to the patient an effective amount of terguride or a pharmacologically acceptable salt thereof.

4,711,892

CERTAIN 5-NITRO-2-FURYL DERIVATIVES OF PYRIDYLPROPENOIC ACID HYDRAZIDES WHICH ARE USEFUL IN TREATING BACTERIAL, FUNGAL, PROTOZOAL, PARASITIC AND INTESTINAL INFECTIONS

Philippe Manoury, Verrieres le Buisson; Daniel Obitz, Antony, and Michel Peynot, L'Hay les Roses, all of France, assignors to Synthelabo, Paris, France

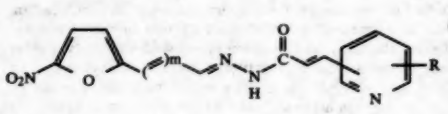
Filed Apr. 10, 1986, Ser. No. 851,113

Claims priority, application France, Apr. 11, 1985, 8505424

Int. Cl.[4] C07D *405/12*; A61K *31/44*

U.S. Cl. 514—336 **8 Claims**

1. A compound of formula (I)



(I)

in which

m is 0 or 1 and

R is hydrogen or (C_{1-4})alkoxy.

4,711,893

USE OF HYDROXYINDOLE DERIVATIVES IN LOWERING BLOOD PRESSURE

Hans-Heinrich Hausberg, Ober-Ramstadt; Henning Böttcher; Christoph Seyfried, both of Darmstadt, and Rolf Bergmann, Reichelsheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

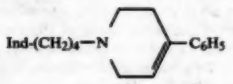
Continuation-in-part of Ser. No. 738,329, May 28, 1985, abandoned. This application Sep. 16, 1986, Ser. No. 907,909

Claims priority, application Fed. Rep. of Germany, May 28, 1984, 3419935

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—339 **10 Claims**

1. A method of lowering blood pressure in a patient in need of such treatment comprising administering to the patient an effective amount of an hydroxyindole of the formula



wherein Ind is 4-, 5-, 6- or 7-hydroxyindole-3-yl, or 4-, 5-, 6- or 7-hydroxyindole-3-yl substituted in the 2-position by C_{1-3} alkyl, or monosubstituted or disubstituted in the benzene ring by C_{1-3} alkyl, F, Cl, Br or CN, or a physiologically acceptable acid addition salt thereof.

4,711,894

STABILIZED TOCOPHEROL IN DRY, PARTICULATE, FREE-FLOWING FORM

Bruce E. Wenzel, Bloomington, and James P. Clark, Richfield, both of Minn., assignors to Henkel Corporation, Ambler, Pa.

Filed Jan. 16, 1986, Ser. No. 819,779

Int. Cl.[4] A61K *31/355*

U.S. Cl. 514—458 **8 Claims**

1. In a dry, potency stabilized, particulate, free-flowing tocopherol composition of a carrier and a tocopherol compound, the improvement wherein said tocopherol compound is d- or d,l-alpha-tocopherol and said composition contains a potency stabilizer selected from the group consisting of ascorbic acid, a mixture of ascorbic acid and cysteine and a mixture of citric acid and cysteine said potency stabilizer being present in an amount of about 2–50% by weight based on the total weight of tocopherol and stabilizer and wherein the weight ratio of tocopherol to stabilizer is from 98:2 to about 1:1.

4,711,895

4-HYDROXY-2-CYCLOPENTENONE, PROCESS FOR PRODUCTION THEREOF, PHARMACEUTICAL COMPOSITION COMPRISING IT

Atsuo Hazato; Satsohi Sugiura, both of Hino; Seizi Kurozumi, Kokubunji, and Ryoji Noyori, Aichi, all of Japan, assignors to Teijin Limited, Osaka, Japan

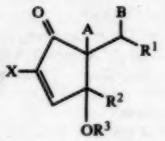
Filed Oct. 22, 1985, Ser. No. 791,156

Claims priority, application Japan, Oct. 22, 1984, 59-220475; Oct. 22, 1984, 59-220476; Feb. 18, 1985, 60-28429; Jun. 18, 1985, 60-130845

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—530 **9 Claims**

1. A 4-hydroxy-2-cyclopentenone represented by the following formula (I)



(I)

wherein X represents a hydorgen or halogen atom, A represents a hydrogen atom and B represents a hydroxyl group, or A and B are bonded to each other to represent a bond, R^1 represents a substituted or unsubstituted alkyl, alkenyl or alkynyl group having 1 to 10 carbon atoms, R^2 represents a substituted or unsubstituted alkyl grop having 1 to 10 carbon atoms, and wherein the substituents on the group R^1 and R^2 may be identical or different from each other and are selected from a group of the formula —$COOR^4$ in which R^4 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or one equivalent of a cation; a group of the formula —OR^5 in which R^5 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms which may be substituted by a halogen atom, a carboacyl group having 1 to 7 carbon atoms, or a phenyl group, the phenyl group being optionally substituted by a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms; a phenyl group which may be substituted by a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms; a cycloalkyl group having 3 to 8 carbon atoms which may be substituted by a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms; or a residue or a carbohydrate, and R^3 represents a hydrogen atom, a carboacyl group having 2 to 7 carbon atoms, a tri(C_1–C_7)hydrocarbonsilyl group, or a group forming an acetal linkage together with the oxygen atom of the hydroxyl group.

7. A pharmaceutical composition comprising a pharmaceutically effective amount of a least one 4-hydroxy-2cyclopentenone of claim 1 and a pharmaceutically acceptable carrier.

4,711,896
α, ω-DICARBOXYLIC ACIDS AND MEDICAMENTS WHICH CONTAIN THESE COMPOUNDS

Jacob Bar-Tana, Jerusalem, Israel; Ernst-Christian Witte, Mannheim, Fed. Rep. of Germany; Bernd Hagenbruch, Lampertheim, Fed. Rep. of Germany; Johannes Pill, Leimen, Fed. Rep. of Germany, and Karlheinz Stegmeier, Heppenheim, Fed. Rep. of Germany, assignors to EPIS S.A., Zug, Switzerland

PCT No. PCT/EP85/00288, § 371 Date Feb. 21, 1986, § 102(e) Date Feb. 21, 1986, PCT Pub. No. WO86/00298, PCT Pub. Date Jan. 16, 1986

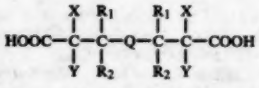
PCT Filed Jun. 15, 1985, Ser. No. 840,563

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423166

Int. Cl.[4] A61K *31/19*; C07C *121/48, 121/50, 57/34*

U.S. Cl. 514—570 **8 Claims**

1. An α,ω-dicarboxylic acid compound of formula I'



(I')

(II)

in which R_1 and R_2, which can be the same or different, signify a C_1–C_6 lower alkyl group, which is unsubstituted or is substituted by hydroxyl, C_1–C_6 lower alkoxy, halogen, phenyl or phenyl substituted one or more times by hydroxyl, C_1–C_6 lower alkoxy, C_1–C_6 lower alkyl or halogen, a C_2–C_6 lower alkenyl or C_2–C_6 alkynyl group; a C_3–C_7 cycloalkyl group, a phenyl group, or a phenyl group substituted by hydroxyl, halogen, C_1–C_6 lower alkyl or C_1–C_6 lower alkoxy,

X and Y, which can be the same or different, signify hydrogen, C_1–C_6 lower alkyl, C_1–C_6 lower alkoxy, hydroxyl, cyano, halogen, carboxyl, C_1–C_6 lower alkoxycarbonyl or carbamoyl, and

Q represents a —$(CH_2)_n$—cyclohexylidene—$(CH_2)_n$—, a —$(CH_2)_m$—phenylene—$(CH_2)_m$—, a —CH_2—CH=CH—phenylene—CH=CH—CH_2— or a —CH_2—CH=CH—CH_2—phenylene—CH_2—CH=CH—CH_2—group, n is 2, 3 or 4 and m is 3 or 4,

or an in vivo hydrolysable carboxylic acid derivative thereof.

7. A pharmaceutical composition comprising a lipid sinking or antidiabetic effective amount of the compound of claim 1 in admixture with usual carrier and adjuvant materials.

4,711,897
ANIMAL FEED METHODS AND COMPOSITIONS USING CYSTEAMINE

Thomas O. Lindsey, Coatesville, Pa., and Michael T. Zavy, El Reno, Okla., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Apr. 24, 1985, Ser. No. 726,751

Int. Cl.[4] A23K *1/16*

U.S. Cl. 514—665 **4 Claims**

1. An animal feed composition comprising a whole animal feed ration or a premix and cysteamine as a supplement consisting essentially of said supplement in an amount effective for increasing the growth rate of an immature, meat producing, monogastric animal but which is not toxic to said animal, said amount being from about 25 to 250 ppm of cysteamine base.

4,711,898
4-QUINOLONE DERIVATIVES HAVING ANTI-INFLAMMATORY, ANTI-ALLERGIC, ANTITUSSIVE, EXPECTORANT AND ANTITHROMBOTIC ACTIVITY

Hiroshi Enomoto, Nagoakakyo; Tadatoshi Nomura, Uji; Yoshiaki Aoyagi, Otsu; Shoichi Chokai, Kameoka; Yukio Fujita, Takatsuki; Tatsuhiko Kono, Suita; Masao Murase, Kusatsu; Kichiro Inoue, Kyoto, and Masahiro Adachi, Hirakata, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Continuation of Ser. No. 504,246, Jun. 14, 1983, abandoned.

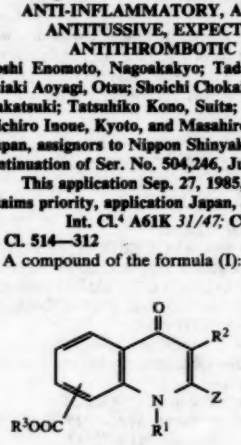
This application Sep. 27, 1985, Ser. No. 781,142

Claims priority, application Japan, Jun. 14, 1982, 57-102592

Int. Cl.[4] A61K *31/47*; C07D *215/48*

U.S. Cl. 514—312 **17 Claims**

1. A compound of the formula (I):

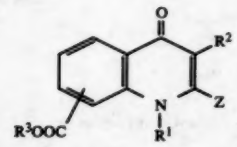


(I)

or a pharmaceutically aceptable salt thereof, wherein R^1 and R^2 are each hydrogen, alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 4 carbon atoms; R^3 is hydrogen, alkyl of 1 to 8 carbon atoms unsubstituted or substituted by one or two hydroxyl moieties, alkyl of 3 to 10 carbon atoms with one or two ether bonds unsubstituted or substituted by 1 hydroxyl group or —$(CH_2)_n$A wherein n is an integer of 1 to 3 and A is acetyl, acetoxy, ethoxycarbonyl, ethoxycarbonylacetyl, cyano or phenoxy, phenylethyl or allyl; and Z is phenyl unsubstituted or substituted by one or two halo atoms, one or two alkyl moieties of 1 to 8 carbon atoms, haloalkyl of 1 to 3 carbon atoms, one or two alkoxy moieties of 1 to 4 carbon atoms or $COOR^4$ wherein

R^4 is hydrogen or alkyl of 1 to 4 carbon atoms; or Z is pyrrolyl, pyrrolinyl, pyridyl, furyl or thienyl.

5. A method of effecting anti-inflammatory, anti-allergenic, antitussive, expectorant and antithromotic action in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula (I):



(I)

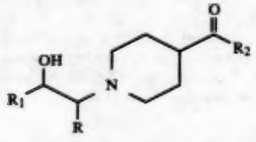
or a pharmaceutically acceptable salt thereof, wherein R^1 and R^2 are each hydrogen, alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 4 carbon atoms; R^3 is hydrogen, alkyl of 1 to 8 carbon atoms unsubstituted or substituted by one or two hydroxyl moieties, alkyl of 3 to 10 carbon atoms with one or two ether bonds unsubstituted or substituted by 1 hydroxyl group or $-(CH_2)_nA$ wherein n is an integer of 1 to 3 and A is acetyl, acetoxy, ethoxycarbonyl, ethoxycarbonylacetyl, cyano or phenoxy, phenylethyl or allyl; and Z is phenyl unsubstituted or substituted by one or two halo atoms, one or two alkyl moieties of 1 to 8 carbon atoms, haloalkyl of 1 to 3 carbon atoms, one or two alkoxy moieties of 1 to 4 carbon atoms or $COOR^4$ wherein R^4 is hydrogen or alkyl of 1 to 4 carbon atoms; or Z is pyrrolyl, pyrrolinyl, pyridyl, furyl or thienyl, in combination with a pharmaceutically acceptable carrier.

4,711,899
2-(4-BENZOYL-1-PIPERIDYL)-1-PHENYLALKANOL DERIVATIVES

Bernard Gaudilliere, Nanterre, and Jean Rousseau, Bourg La Reine, both of France, assignors to Synthelabo, Paris, France

Filed May 13, 1986, Ser. No. 862,715
Claims priority, application France, May 14, 1985, 85 07270
Int. Cl.[4] A61K *31/445*; C07D *211/32*
U.S. Cl. 514—330 **9 Claims**

1. A compound of formula (I)



(I)

in which R is hydrogen or methyl, R_1 is unsubstituted phenyl, 4-methoxy-3,5-dimethyl phenyl or phenyl substituted at one of the 2-, 3- or 4-positions by halogen, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy, benzyloxy, trifluoromethyl, cyano, nitro, amino, acetylamino, methylthio, methylsulphonyl or aminosulphonyl and R_2 is unsubstituted phenyl, 2,4,6-trimethoxyphenyl or phenyl substituted at either the 3- or the 4-position by fluorine, chlorine, methyl or methoxy, or a pharmaceutically acceptable, acid addition salt thereof.

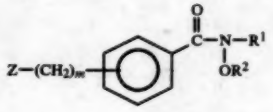
6. A method for treating humans or non-human animals suffering from anoxia comprising adminstering an amount of a compound of formula (I) as defined in claim 1 to a human or animal need thereof effective for the treatment of anoxia.

4,711,900
CERTAIN ARYLALKYL OR PYRIDYLALKYL HYDROXAMATES USEFUL FOR TREATING ALLERGIES AND ASTHMA

Ravi K. Varma, Belle Mead, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 23, 1986, Ser. No. 888,616
Int. Cl.[4] C07C *83/10*; C07D *213/64*; A61K *31/235, 31/44*
U.S. Cl. 514—351 **13 Claims**

1. A compound having the structure

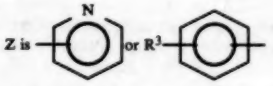


wherein

R^1 is H, alkyl, aryl, lower alkenyl having 3 to 8 carbons, cycloalkyl having 3 to 12 carbons, or aryl-alkyl;

R^2 is H, alkyl, aryl, cycloalkyl having 3 to 12 carbons, alkanoyl or aroyl;

m is 2 to 8;

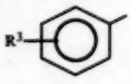


wherein

R^3 is COOH; and

$(CH_2)_m$ is unsubstituted or substituted with 1 or 2 alkyl and/or 1 or 2 halogen substituents;

and where Z is



including pharmaceutically acceptable basic salts thereof, wherein the term alkyl by itself or as part of another group is a straight chain or branched chain radical having 1 to 12 carbons and is unsubstituted or substituted with halogen, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio; and the term aryl by itself or as part of another group is a monocyclic or bicyclic aromatic group having 6 to 10 carbons in the ring portion and is unsubstituted or substituted with 1 or 2 alkyl groups, 1 or 2 halogens, 1 or 2 alkoxy groups, an aryl group, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups.

13. A method for treating asthma in a mammalian species in need of such treatment, which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,711,901

1-6-NAPHTHYRIDINE DERIVATIVES USEFUL IN THE TREATMENT OF BLOOD VESSEL DISEASES

Gerhard Satzinger, Im Mattenbühl 7, 7809 Denzlingen; Johannes Hartenstein, Fohrenbühl 23, 7801 Stegen-Wittental; Karl Mannhardt, Pfauenstr. 14, 7807 Elzach-Oberprechtal; Jürgen Kleinschroth, Freiburger Str. 13, 7809 Denzlingen; Hartmut Oswald, Kiefernweg 1, 7808 Waldkirch 2; Günter Weinheimer, Sachsenstr. 4, 7809 Denzlingen, and Edgar Fritschi, Am Scheuerwald 2, 7811 St. Peter, Fed. Rep. of Germany

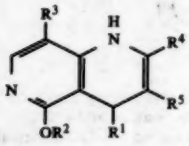
Continuation-in-part of Ser. No. 767,989, Aug. 21, 1985, abandoned. This application Jul. 30, 1986, Ser. No. 891,712

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431303; Jan. 29, 1985, 3502790

Int. Cl.[4] A61K *31/44;* C07D *471/04*

U.S. Cl. 514—300 12 Claims

1. A compound of the formula



wherein R^1 is a phenyl radical which is unsubstituted or is mono or disubstituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, difluoromethoxy, trifluoromethoxy, lower alkendioxy, lower alkylamino, methylthio, difluoromethylthio or trifluoromethyl or R^1 is a thienyl, pyridyl or 2, 1, 3-benzoxadiazolyl radical, R^2 is a straight-chained or branched alkyl radical containing up to four carbon atoms or a benzyl radical, R^3 is a hydrogen atom, a straight-chained or branched alkyl radical containing up to four carbon atoms or an alkoxycarbonyl radical containing up to five carbon atoms, R^4 is a straight-chained or branched alkyl radical containing up to four carbon atoms, and R^5 is a carboxyl group or a straight-chained, branched or cyclic alkoxy-carbonyl radical which contains up to 17 carbon atoms and which chain may be interrupted by an oxygen, sulphur, or nitrogen atom, or a pharmacologically acceptable salt thereof.

9. A compound having the name 2-(N-benzyl-N-methylamino)-ethyl(±)-1,4-dihydro-5-isopropoxy-2-methyl-4-(2-trifluoromethylphenyl)-1,6-naphthyridine-3-carboxylate or a pharmacologically acceptable salt thereof.

4,711,902

MEDICAMENT FORMULATION

Peter Serno, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,469

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339236

Int. Cl.[4] A61K *31/44, 31/41, 31/415, 31/24*

U.S. Cl. 514—356 24 Claims

1. A medicament formulation in the form of a lipid emulsion for intravenous injection comprising a medicinally active compound, a lipid phase, a physiologically tolerated emulsifier and water, the lipid phase being present in an amount of 5 to 20% by weight, the emulsifier being present in about 0.1 to 10% by weight, and water being present up to 100%, the lipid phase containing up to about 50% by weight of a sparingly soluble medicinally active compound, and an ester component said ester component being

at least one ester of at least one C_6 to C_{12} fatty acid.

4,711,903

PHENOLIC THIOETHERS AS INHIBITORS OF 5-LIPOXYGENASE

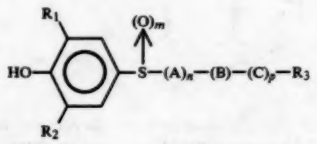
Richard A. Mueller, Glencoe; Richard A. Partis, Evanston, and James R. Deason, Wilmette, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 31, 1986, Ser. No. 824,984

Int. Cl.[4] C07C *149/40;* A61K *37/10*

U.S. Cl. 514—381 20 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein R_1 and R_2 are the same or different and independently represent tert-alkyl or phenyl; A represents methylene or methylene substituted by alkyl, dialkyl or hydroxy, provided that when A includes hydroxymethylene, the hydroxymethylene group is not adjacent to a heteroatom; B represents sulfur, sulfoxide, sulfone, oxygen, —NH— or nitrogen substituted by alkyl, phenyl, benzyl, phenyl substituted by one or two substituents which may be the same or different and are independently selected from the group consisting of halogen, C_1–C_6 alkyl, hydroxy, C_1–C_6-alkoxy, acetoxy, carboxylic acid and C_1–C_6 alkyl esters thereof, nitro or phenyl or benzyl substituted by one or two substituents which may be the same or different and are independently selected from the group consisting of halogen, C_1–C_6 alkyl, hydroxy, C_1–C_6 alkoxy, acetoxy, carboxylic acid and C_1–C_6 alkyl esters thereof, nitro or phenyl; C represents methylene or methylene substituted by alkyl; R_3 represents CO_2H, CO_2-alkyl, or a tetrazole group; m is 0 or 1, n is 2, 3, or 4 and p is 1, 2, or 3.

11. A pharmaceutical composition for the treatment of inflammation and allergy conditions comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,711,904

METHOD OF TREATING SKIN DISORDERS

Louis A. Luzzi, and Joyce K. Luzzi, both of 165 Sakonnet Blvd., Narragansett, R.I. 02882

Filed Aug. 4, 1986, Ser. No. 893,049

Int. Cl.[4] A61K *31/36*

U.S. Cl. 514—464 8 Claims

1. A method of treating skin tissue for a skin disorder of a viral, bacterial or fungal nature comprising applying thereto an effective amount of composition wherein the main active ingredient comprises dimethyl isosorbide.

4,711,905

2,4-DIHALOGENOBENZOYL-(THIO)UREA INSECTICIDES

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal; Ingeborg Hammann, Mulheim, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

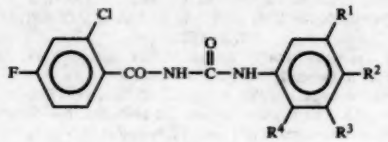
Division of Ser. No. 489,901, Apr. 28, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,554

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217619

Int. Cl.[4] A01N *47/34;* C07C *127/22*

U.S. Cl. 514—522 14 Claims

1. A 2,4-dihalogenobenzoyl-(thio)urea of the formula



(I)

in which

R^1 represents hydrogen, halogen, or an optionally halogen-substituted radical from the series comprising C_1–C_6-alkyl, C_1–C_6-alkoxy and C_1–C_6-alkylthio,

R^2 represents a phenoxy which is optionally substituted by halogen, cyano, nitro, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkylthioalkyl, C_1–C_4-alkylsulphonyloxy, phenyl and/or C_1–C_4-alkoxycarbonyl,

R^3 represents hydrogen, halogen, or an optionally halogen-substituted C_1–C_6-alkyl, C_1–C_6-alkoxy or phenoxy radical, and

R^4 represents hydrogen, halogen, or optionally halogen-substituted radicals from the series comprising C_1–C_6-alkyl, C_1–C_6-alkylthio and C_1–C_6-alkoxy.

13. A method of combating insects which comprises applying to such insects an insecticidally effective amount of a compound according to claim 1.

4,711,906

LIQUID DICLOFENAC PREPARATIONS

Otto von Stetten, Schelklingen, Fed. Rep. of Germany; Pyare L. Seth, Aesch, Switzerland; Franz Schmid, Pfaffenhofen, and Kurt Rauchle, Blaubeuren, both of Fed. Rep. of Germany, assignors to Merckle GmbH, Blaubeuren, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,424

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446873

Int. Cl.[4] A61K *09/06, 27/00*

U.S. Cl. 514—561 **19 Claims**

1. A stable, liquid diclofenac preparation, especially for the parenteral application, consisting of a solution of diclofenac or one of its salts in an amount of 1.5–6.0 weight % diclofenac in a solvent, wherein the solvent consists of 10–70 weight % of a mixture of (a) propylene glycol and (b) polyethylene glycol and 30–90 weight % water, and the weight ratio of (a) propylene glycol to (b) polyethyelene glycol is between 9.5:0.5 and 0.5:9.5.

4,711,907

MEMBRANES OF SUBSTANTIALLY NON-CROSSLINKED ORGANIC POLYMERS WHICH CONTAIN BONDED IONOGENIC GROUPS

Hans-Josef Sterzel, Dannstadt-Schauernheim, and Axel Sanner, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,718

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407719

Int. Cl.[4] C08P *5/20*

U.S. Cl. 521—27 **7 Claims**

1. An electrodialysis membrane which comprises: a substantially non-crosslinked acid and base resistant organic polymer containing aromatic structural elements and having a softening point above 80° C. and alkylene radicals bonded to the aromatic structural elements of the polymer chain, said alkylene radicals containing ionogenic groups attached to the alkylene radicals at intervals of not less than 4 carbon atoms from the polymer chain.

4,711,908

SKINLESS POROUS PARTICLE PVC RESIN AND PROCESS FOR PRODUCING SAME

Roman B. Hawrylko, North Olmsted, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 14, 1987, Ser. No. 38,099

Int. Cl.[4] C08J *9/28*

U.S. Cl. 521—56 **24 Claims**

1. An agitated aqueous suspension process for producing porous, skinless, agglomerated polyvinyl chloride resin particles comprising polymerizing vinyl monomer in the presence of from about 0.01 part by weight to about 0.1 part by weight per 100 parts by weight of polymerizable monomer of at least one ionic sensitive primary dispersant capable of thickening water, and at least one secondary dispersant, wherein an a monovalent inorganic or organic ionic compound in amounts sufficient to desorb a substantial amount of said primary dispersant off the monomer droplets, is charged to the polymerization medium at from about 1% to about 5% conversion of mononer to polymer, thereby producing a skinless, agglomerated, porous PVC resin in particulate form, said resin particles having a mercury porosity of from about 0.1 cc/g to about 0.7 cc/g, and a particle size of from about 70 microns to about 1000 microns, and a friability of less than about 2, and a powder mix time of less than about 400 seconds, and a shape factor less than about 0.85 and wherein greater than about 20% of the area of the surface of said particle is PVC as measured by ESCA.

4,711,909

NEW DISPERSIONS AND THE PREPARATION OF FOAMED RESINS THEREFROM

Ronald L. Pastorino, San Anselmo, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Witco Corporation, New York, N.Y.

Division of Ser. No. 934,734, Nov. 25, 1986. This application Apr. 3, 1987, Ser. No. 33,680

Int. Cl.[4] C08J *9/08*

U.S. Cl. 521—69 **10 Claims**

1. In the method for making a foamed polyester resin by curing and crosslinking unsaturated polyester resin and expanding the resin into a cellular structure with a gas, the improvement which comprises incorporating into the resin an aqueous dispersion comprising a symmetrical or asymmetrical aromatic diacyl peroxide; an alkali metal carbonate or bicarbonate or mixtures thereof; a dispersion stabilizing amount of magnesium aluminum silicate and alkali metal carboxymethyl cellulose and sufficient water to form an aqueous dispersion in an amount sufficient to effect curing and foaming of the unsaturated polyester resin.

4,711,910

PREPARATION OF FIRE RETARDANT FLEXIBLE POLYESTER BASED POLYURETHANE FOAMS HAVING REDUCED DISCOLORATION AND SCORCH

Gary L. Statton, West Chester, and James M. Gaul, Exton, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 24, 1986, Ser. No. 922,629

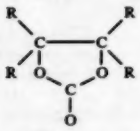
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

Int. Cl.[4] C08G *18/14, 18/16, 18/30*

U.S. Cl. 521—107 **11 Claims**

1. A method for the preparation of a scorch and discoloration stabilized fire retarded flexible polyurethane foam which comprises reacting an organic di- or polyisocyanate with a polyester polyol having a hydroxyl number of about 25 to 75 and a functionality of 2 to 3 in the presence of a fire retardant compound, a polyalkylene oxide siloxane block copolymer surfactant, a tertiary amine or organic metal salt catalyst, a blowing agent selected from the group consisting of water which reacts with the di- or polyisocyanate to generate carbon

dioxide and fluorocarbons having a boiling point below 60° C. mixed with water and methylene chloride mixed with water and from about 1 to about 12 parts by weight based on the polyester polyol of a cyclic alkylene carbonate of the formula



wherein R is independently hydrogen, an alkyl group having from 1 to 8 carbon atoms, an alkenyl group having from 1 to 8 carbon atoms or a phenyl group.

4,711,911

PROCESS FOR THE PRODUCTION OF PHENOLIC RESINS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Filed Dec. 22, 1986, Ser. No. 944,969

Int. Cl.[4] C08V *9/00*

U.S. Cl. 521—123 **21 Claims**

1. The process for the production of a foamed phenolic resin by mixing and reacting the following components:

(A) Substituted organic compound which contains a hydroxyl radical or an epoxy radical and the substituent selected from the group consisting of halogens, acid sulfate, nitrate, acid phosphate, bicarbonate, formate, acetate, propionate, laurate, oleate, stearate, oxalate, acid malonate, acid tartrate, acid citrate, and mixtures thereof, in the amount of 10 to 100 parts by weight;

(B) Monohydric phenol, selected from the group consisting of phenol, ortho-cresol, meta-phenol, para-cresol and mixtures thereof in the amount of 10 to 50 parts by weight;

(C) Alkali salt-forming compound in the amount of 1 to 50 parts by weight; and

(D) a blowing agent.

4,711,912

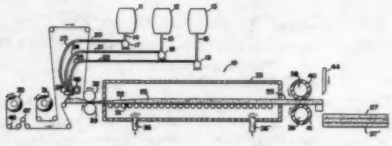
POLYISOCYANURATE FOAMS FROM DIGESTION PRODUCTS OF POLYALKYLENE TEREPHTHALATE POLYMERS AND POLYOLS

Scott C. Snider, Pinellas Park, and Alberto DeLeon, Clearwater, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Apr. 29, 1982, Ser. No. 372,904

Int. Cl.[4] C08G *18/00, 18/14*

U.S. Cl. 521—125 **35 Claims**



1. A polyisocyanurate foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol mixture prepared by digesting polyalkylene terephthalate with a polyol, wherein the equivalent ratio of said organic polyisocyanate to said polyol mixture is at least 1.5:1.

4,711,913

INTERPENETRATING POLYMER NETWORK COMPOSITIONS EMPLOYING RUBBER-MODIFIED POLYMERS

Louis H. Tateosian, and W. Donald Wilson, both of York, Pa., assignors to Dentsply International Inc., York, Pa.

Continuation-in-part of Ser. No. 552,300, Nov. 16, 1983, Pat. No. 4,551,486. This application Sep. 25, 1984, Ser. No. 654,860

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] C08F *2/50;* **C08K** *3/08;* **C08L** *31/06, 51/04*

U.S. Cl. 522—14 **10 Claims**

1. A polymerizable composition comprising:

(a) from about 10 to about 70 weight percent of di- or polyfunctional crosslinking composition;

(b) from about 3 to about 70 weight percent of polymer composition comprising:

(1) from about 1 to about 90% by weight of polymer composition of ethylenically crosslinked addition polymer in the form of discrete particles having average diameters up to about 500 microns and being swellable in the crosslinking composition; and

(2) at least about 10% by weight of polymer composition of rubber-modified polymer comprising particles of an elastomer having a glass transition temperature below about 0° C. and having average diameters less than about 5 microns, said particles being overpolymerized with from about 10% to about 80%, by weight of the resulting overpolymerized particles, of monomeric species, said overpolymerized particles being subsequently polymerized with the same or different monomeric species to form macroparticles comprising from about 80% to about 98% of said same or different monomeric species, the macroparticles having average diameters less than about 200 microns.

4,711,914

MICROBIOCIDAL COMPOSITIONS COMPRISING AN ARYL ALKANOL AND A MICROBIOCIDAL COMPOUND DISSOLVED THEREIN

Nuno M. Rei, Boxford, and Ronald C. Wilson, Wenham, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 724,463, Apr. 22, 1985, Pat. No. 4,683,080, which is a continuation-in-part of Ser. No. 619,092, Jun. 11, 1984, Pat. No. 4,663,077. This application Feb. 20, 1987, Ser. No. 17,382

Int. Cl.[4] C08K *5/34, 5/47, 5/56*

U.S. Cl. 523—122 **22 Claims**

1. A process for imparting microbiocidal properties to a polymer composition comprising adding to the polymer composition, in an amount at least sufficient to impart microbiocidal properties to the polymer composition, a microbiocidal composition comprising a polymer processing aid, and from about 5% to about 20% by weight based on the total weight of the microbiocidal composition, of a microbiocidal compound, said microbiocidal compound being present at the solute in an aryl alkanol solvent, and the aryl alkanol solvent being present in an amount such that the weight ratio of the aryl alkanol solvent to microbiocidal compound is from about 3/1 to about 5/1.

4,711,915

SURFACE COATING COMPOSITIONS CONTAINING SUBSTITUTED 1,3,4-THIADIAZOLES

Lester A. Doe, Jr., Newtown, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

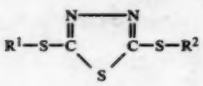
Filed Apr. 7, 1986, Ser. No. 848,535

Int. Cl.[4] C08K *5/46;* **C07D** *285/12;* **C09D** *5/14*

U.S. Cl. 523—122 **5 Claims**

1. An improved surface coating composition comprising a binder selected from the group consisting of alkyd resins and acrylic resins, and about 0.1 to 5.0 percent by weight of the

composition of an antimicrobially active compound having the structural formula



wherein R^1 and R^2 each represent an alkyl group having 1 to 8 carbon atoms to inhibit the growth of microorganisms on the dry film formed from said coating composition.

4,711,916

INORGANIC FILLER DISPERSED-RESIN COMPOSITION

Takeshi Hagiwara; Masataka Matsuo, both of Fukuoka; Tanezoh Tamehiro, Hyogo; Taizo Tamehiro, Hyogo, and Kakuichi Murakami, Hyogo, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Harima Refractory Co., Ltd., Takasago, both of, Japan

Continuation of Ser. No. 537,441, Sep. 30, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 828,094

Claims priority, application Japan, Sep. 30, 1982, 57-172266

Int. Cl.[4] C08K *3/36, 3/22*

U.S. Cl. 523—223 **9 Claims**

1. A ceramic filler dispersed resin composition comprising a resin matrix and fine spherical ceramic particles dispersed in the resin matrix, said ceramic spherical filler particles having been prepared by passing ceramic particles through a flame of propane-oxygen at a temperature not lower than 2,000° C.

4,711,917

CATIONIC COATING COMPOSITIONS FOR ELECTRODEPOSITION OVER ROUGH STEEL

Gregory J. McCollum, Glenshaw; Roger L. Scriven, Gibsonia; Roger M. Christenson, Gibsonia; George W. Mauer, Gibsonia, and Robert R. Zwack, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 698,993, Feb. 7, 1985, Pat. No. 4,615,779. This application Jun. 27, 1986, Ser. No. 879,709

Int. Cl.[4] C08L *63/00*

U.S. Cl. 523—400 **9 Claims**

1. An electrocoating composition comprising a cationic resin containing blocked polyisocyanate functionality, said cationic resin being derived from a polyepoxide having a 1,2-epoxy equivalency greater than one and having cationic groups selected from amine salt groups, quaternary ammonium base groups, quaternary phosphonium groups and ternary sulfonium groups, said cationic resin having a weight average molecular weight less than 50,000 as determined by gel permeation chromatography; the blocking agent for the polyisocyanate being volatile under curing conditions and having an average molecular weight of 76 or less; said electrocoating composition being pigmented in which the pigments have a size of 6 to 8 as determined with a Hegman grinding gauge, the pigment to resin weight ratio being less than 0.4:1; said electrocoating composition being further characterized such that upon electrodeposition and heating to maximum flow, the incompletely cured coating has a profile of less than 0.160 microns, and upon heating to complete cure, the percentage cured film weight loss is less than 10, and the product of the profile and the square of the percentage cured film weight loss is less than 7.5.

4,711,918

USE OF POLYISOCYANATES OR POLYISOCYANATE MIXTURES AS ADDITIVES FOR AQUEOUS EMULSION PAINTS

Werner Kubitza, and Gerhard Mennicken, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 892,220

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529249

Int. Cl.[4] C08K *5/29*

U.S. Cl. 524—196 **8 Claims**

5. A process for improving the coatings properties of an aqueous emulsion paint having a binder comprising a homo or copolymer of olefinically unsaturated monomers substantially free from urethane groups which comprises adding to said aqueous emulsion paint, without adding a formaldehyde-based condensation resin, an organic polyisocyanate component having aliphatically and/or cycloaliphatically bound isocyanate groups, a viscosity at 23° C. of about 50 to 4000 mPa.s and an average isocyanate functionality of at least 2.2, wherein said organic polyisocyanate component comprises at least a portion of an organic polyisocyanate having an isocyanate functionality of at least 3.

4,711,919

WATER-SOLUBLE POLYMERS PLUS NATURAL RESINS SIZING AGENT

Reinmar Peppmöller, Krefeld, and Friedlieb Koschier, Sippersfeld, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,064

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1984, 3405019

Int. Cl.[4] C08L *93/00, 93/04*

U.S. Cl. 524—77 **10 Claims**

1. A mixture comprising

(A) a polymer comprising by weight at least 80% of at least one of acrylamide or methacrylamide, up to 5% of at least one of acrylonitrile, methacrylonitrile, vinyl acetate, maleic acid, diisobutane, or a (meth)acrylic acid ester of a monovalent primary alcohol with 1 to 5 carbon atoms, and 5 to 20% of at least one of acrylic acid or methacrylic acid, and at least one of

(B) a completely saponified rosin, balsam resin or wood resin or

(C) a partially saponified rosin, balsam resin or wood resin, (A) being present in 3 to 50% and (B), (C) or (B) plus (C) being present in 97 to 50% by weight of (A) plus (B), (C) or (B) plus (C).

4,711,920

STABILIZERS FOR HALOGEN-CONTAINING POLYMERS COMPRISING THE PRODUCT OF A DIORGANOTIN OXIDE, AN ETHYLENICALLY UNSATURATED DICARBOXYLIC ACID ESTER AND A MERCAPTAN

Thomas G. Kugele; Keith A. Mesch; Karl R. Wursthorn, and Gary M. Conroy, all of Cincinnati, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

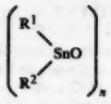
Filed Jul. 23, 1986, Ser. No. 889,323

Int. Cl.[4] C08K *5/57, 5/58;* **C07F** *7/22*

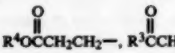
U.S. Cl. 524—178 **26 Claims**

1. A stabilizing composition for stabilizing halogen-containing organic polymers against the deteriorative effect of heat, light and weathering, said composition comprising the reaction product produced by combining:

A. a diorganotin oxide compound containing organic groups linked to tin only through carbon and having the formula:

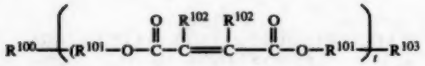


wherein n is an integer of from 1 to 8 and each of R^1 and R^2, have from about one to about twenty carbon atoms and are selected from the group consisting of alkyl, alkylene, alkenyl, aryl, cycloalkyl, alkylcycloalkyl, arylalkyl,



and N≡CCH_2CH_2— wherein R^3 is selected from alkyl, alkylene, alkenyl, aryl, cycloalkyl, alkylcycloalkyl and aralkyl and R^4 is selected from hydrogen and R^3;

B. an ethylenically unsaturated dicarboxylic acid ester compound having one carboxyl group on each atom of the ethylene group and being selected from the group consisting of compounds of the formulas:



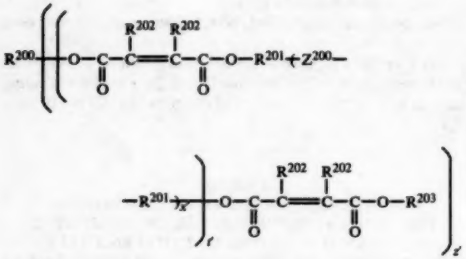
wherein:

R^{100} and R^{103} are the same or different, and are at each independent occurrence alkyl, alkenyl, cycloalkyl, cycloalkenyl, or a multivalent hydrocarbyl or hydroxyl-substituted hydrocarbyl group;

R^{101} is at each independent occurrence a carbon-oxygen bond, alkylene or alkenylene, with the proviso that the total number of carbon atoms in R^{100} plus R^{101} is from 1 to 10 and to total number of carbon atoms in R^{103} plus R^{101} is from 1 to 10;

R^{102} is at each independent occurrence selected from hydrogen, alkyl and alkylene; and

t is an integer of from 1 to about 20, and



wherein:

R^{200} has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, a multivalent hydrocarbyl group having a valence equal to z', a multivalent hydroxyl-substituted hydrocarbyl group having a valence equal to z', and —R^{201}—$Z^{200})_{y'}R^{204}$;

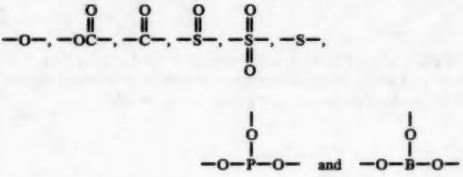
R^{201} is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and a multivalent hydroxyl-substituted hydrocarbyl group;

R^{202} is at each independent occurrence selected from hydrogen, alkyl and alkylene;

R^{203} has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl and —R^{201}—$Z^{200})_{y'}R^{204}$;

R^{204} is at each independent occurrence selected from hydrogen and alkyl;

Z^{200} is at each independent occurrence selected from



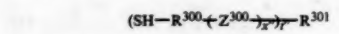
t' is zero or an integer from 1 to about 20;

x' is zero or an integer from 1 to about 20 with the proviso that if x'=0 or t'=0 then R^{200} is —R^{201}—$Z^{200})_{y'}R^{204}$;

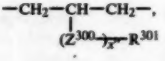
y' is an integer from 1 to 10; and

z' is an integer from 1 to 4, and

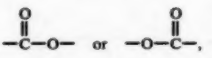
C. a mercaptan containing organic compound of the formula:



wherein R^{300} is alkylene or



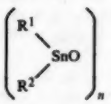
Z^{300} is



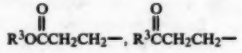
x'' is 0 or 1, t'' is 1 or 2 and R^{301} is hydrogen, hydroxy, alkyl, alkenyl, cycloalkyl, alkylene, alkenylene, aryl and arylalkyl, wherein the chemical equivalence of the mercaptan is less than the chemical equivalence of the diorganotin oxide and the chemical equivalence of the diorganotin oxide is less than the equivalence of the ester compound.

13. A composition comprising a halogen-containing organic polymer and, in an amount sufficient to stabilize said polymer against the deteriorative effects of heat, light and weathering, a stabilizer composition comprising the reaction product produced by combining:

A. a diorganotin oxide compound containing organic groups linked to tin only through carbon and having the formula:



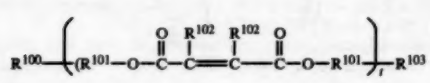
wherein n is an integer of from 1 to 8 and each of R^1 and R^2, have from about one to about twenty carbon atoms and are selected from the group consisting of alkyl, alkylene, alkenyl, aryl, cycloalkyl, alkylcycloalkyl, arylalkyl,



and N≡CCH_2CH_2— wherein R^3 is selected from alkyl,

alkylene, alkyenyl, aryl, cycloalkyl, alkylcycloalkyl and aralkyl;

B. an ethylenically unsaturated dicarboxylic acid ester compound having one carboxyl group on each atom of the ethylene group and being selected from the group consisting of compounds of the formulas:



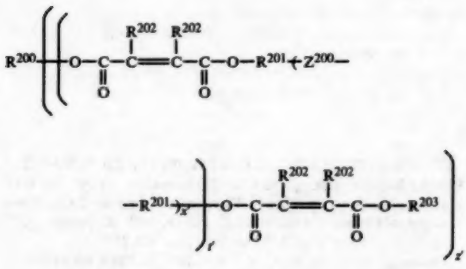
wherein:

R^{100} and R^{103} are the same or different, and are at each independent occurrence alkyl, alkenyl, cycloalkyl, cycloalkenyl, or a multivalent hydrocarbyl or hydroxyl-substituted hydrocarbyl group;

R^{101} is at each independent occurrence a carbon-oxygen bond, alkylene or alkenylene, with the proviso that the total number of carbon atoms in R^{100} plus R^{101} is from 1 to 10 and to total number of carbon atoms in R^{103} plus R^{101} is from 1 to 10;

R^{102} is at each independent occurrence selected from hydrogen, alkyl and alkylene; and

t is an integer of from 1 to about 20, and



wherein:

R^{200} has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, a multivalent hydrocarbyl group having a valence equal to z', a multivalent hydroxyl-substituted hydrocarbyl group having a valence equal to z', and $-R^{201}-Z^{200})_{y'}R^{204}$;

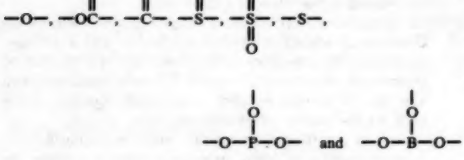
R^{201} is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and a multivalent hydroxyl-substituted hydrocarbyl group;

R^{202} is at each independent occurrence selected from hydrogen, alkyl and alkylene;

R^{203} has from 1 to 10 carbon atoms and is at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl and $-R^{201}-Z^{200})_{y'}R^{204}$;

R^{204} is at each independent occurrence selected from hydrogen and alkyl;

Z^{200} is at each independent occurrence selected from



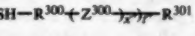
t' is zero or an integer from 1 to about 20;

x' is zero or an integer from 1 to about 20 with the proviso that if x'=0 or t'=0 then R^{200} is $-(-R^{201}Z^{200})_{y'}R^{204}$;

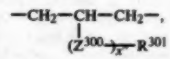
y' is an integer from 1 to 10; and

z' is an integer from 1 to 4, and

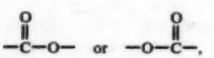
C. a mercaptan containing organic compound of the formula:



wherein R^{300} is alkylene or



Z^{300} is



x'' is 0 or 1, t'' is 1 or 2 and R^{301} is hydrogen, hydroxy, alkyl, alkenyl, cycloalkyl, alkylene, alkenylene, aryl and arylalkyl, wherein the chemical equivalence of the mercaptan is less than the chemical equivalence of the diorganotin oxide and the chemical equivalence of the diorganotin oxide is less than the equivalence of the ester compound.

4,711,921

STABILIZATION OF VINYL CHLORIDE POLYMERS

Marvin H. Lehr, Bath, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 440,887, Nov. 12, 1982, abandoned. This application Oct. 10, 1986, Ser. No. 917,879

Int. Cl.[4] C08K *5/57*

U.S. Cl. 524—180 **9 Claims**

1. A composition comprising a post-chlorinated vinyl chloride polymer and a heat stabilization system comprised of one of particulate barium carbonate and cadmium carbonate, said barium carbonate or cadmium carbonate having a surface area of at least 2 square meters per gram and is present at a concentration range of from about 2.0 to 15.0 parts per 100 parts by weight of the polymer and as a second stabilizer, a dialkyltin compound which is present within the quantity range of 0.5 and 5.0 parts per 100 parts by weight of the polymer.

4,711,922

CITRATE ESTERS AND METHODS

Ezekiel H. Hull, Greensboro, and Edward P. Frappier, Kernersville, both of N.C., assignors to Morflex Chemical Company, Inc., Greensboro, N.C.

Continuation of Ser. No. 735,149, May 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,583, Jun. 11, 1984, abandoned. This application May 21, 1986, Ser. No. 865,874

Int. Cl.[4] C07C *67/08;* **C08K** *5/11*

U.S. Cl. 524—310 **16 Claims**

1. A polyvinyl chloride composition comprising a polyvinyl chloride resin and a plasticizing amount of n-butyryltri-n-hexyl citrate, said n-butyryltri-n-hexyl citrate having heat stability characteristics, when tested at 150° C. for two hours, of a color not greater than 50–60 apha, and a mild odor at 25° C., and also having an aconitate level of less than about 0.2% when the esterification mixture from which said citrate is produced tests 0.5% maximum acidity calculated as citric acid.

4. A medical article formed from a polyvinyl chloride composition comprising a polyvinyl chloride resin, a plasticizing amount of n-butyryltri-n-hexyl citrate, a stabilizer and a lubricant, said citrate having heat stability characteristics, after heating at 150° C. for two hours, of a color not greater than

50–60 apha, and a mild odor at 25° C., and also having an aconitate level of less than about 0.2 percent when the esterification mixture from which said citrate is produced tests 0.5 percent maximum acidity calculated as citric acid.

5. A medical article as claimed in claim 4 comprising a blood bag.

8. A method of producing acetyltri-n-hexyl citrate comprising the steps of: heating n-hexyl alcohol and citric acid in the presence of an organic titanate at a temperature of approximately 140° C. to effect esterification, removing the excess n-hexyl alcohol, and acetylating the ester by adding acetic anhydride and sulfuric acid while maintaining the temperature below approximately 110° C. until the acetylation reaction is complete, wherein the acetyltri-n-hexyl citrate produced has heat stability characteristics, after heating at 150° C. for two hours, of a color not greater than 50–60 apha, and a mold odor at 25° C.

4,711,923

COLOR OF POLYMERS

Vaclav G. Zboril, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Calif.

Division of Ser. No. 847,309, Apr. 2, 1986, Pat. No. 4,666,994. This application Dec. 31, 1986, Ser. No. 948,131

Claims priority, application United Kingdom, Apr. 2, 1985, 8509452

Int. Cl.[4] C08K *5/13, 5/05*

U.S. Cl. 524—323 8 Claims

1. A composition comprising a high molecular weight polymer selected from the group consisting of homopolymers of ethylene or alpha-olefin homologues thereof and copolymers of ethylene with alpha-olefin homologues thereof, an antioxidant and an organozirconium compound, said antiox-idant being a hindered phenolic antioxidant and said organozirconium compound being selected from compounds of the formula $ZrO_m(OCOR')_n(OR'')_{p-n}$ where R' and R'' are independently selected from the group consisting of alkyl and cycloalkyl having 1–20 carbon atoms and m=0 or 1, provided that when m=0, p is 4 and n is 0–4 and when m=1, p is 2 and n=0–2.

4,711,924

CARBOXYLIC ACID-GRAFTED PHENOXY RESINS

George A. Salensky, Hunterdon County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 725,535, Apr. 22, 1985, Pat. No. 4,638,038. This application Oct. 2, 1986, Ser. No. 914,796

Int. Cl.[4] C08K *3/30*

U.S. Cl. 524—402 14 Claims

1. An aqueous emulsion comprising:

(a) a phenoxy resin having pendant secondary hydroxyl groups of which about 3 to about 50% of such hydroxyl groups have been reacted to produce moieties having pendant carboxyl groups, at least some of which carboxyl groups have been neutralized;

(b) water.

4,711,925

PROCESS FOR PREPARING POLYAMIDE-BASED, PULVERULENT COATING COMPOSITIONS FOR HIGH MOLECULAR WEIGHT POST CONDENSATION, EMPLOYING THE PRECIPITATION PROCEDURE

Salih Mumcu, Marl; Hans J. Panoch, Haltern, and Joern Rueter, Marl, all of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 18, 1986, Ser. No. 840,792

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510690

Int. Cl.[4] C08G *69/46*

U.S. Cl. 524—417 12 Claims

1. In the method of producing polyamide powder from polyamide produced in the absence of a molecular weight regulator having a relative viscosity of 1.7 to 2.0 as measured in 0.5% meta-cresol solution at 25° C. and at least 70% of said polyamide consisting of polyamide with at least ten aliphatically bound carbon atoms per carbonamide group, comprising:

(a) dissolving said polyamide in at least twice the amount by weight of ethanol in a closed vessel at a temperature between about 130° to 150° C. to form a solution of said polyamide;

(b) cooling said solution to a precipitation temperature between about 100° and 125° C.;

(c) precipitating said polyamide powder from said cooled solution of (b) with agitation and under an inert gas atmosphere; and

(d) separating said precipitated polyamide powder of (c) from said ethanol,

the improvement comprising:

(e) rapidly cooling said solution of about 130° to 150° C. to a saturation limit of about 125° C. inside temperature with stirring and distillation of said ethanol under its own pressure;

(f) further cooling said solution below said saturation limit with distillation of said ethanol and cooling with a jacket wherein the jacket temperature is at most 3° C. below said inside temperature up until a precipitation temperature within the range 90° to 113° is reached; and

(g) maintaining said solution in the isothermal state during the ensuing precipitation stage by further distillation of ethanol,

the further improvement comprising:

(h) said polyamide containing not more than 0.2% by weight of phosphoric acid; and

(i) adding 0.3 to 1.2% by weight of phosphoric acid referred to the weight of said polyamide after step (a).

4,711,926

COMPOSITION FOR ELECTRODEPOSITION PAINT

Masaki Kojima, Himeji, and Seiji Munekata, Tokyo, both of Japan, assignors to Honny Chemicals Company Ltd., Kobe and Asahi Glass Company Ltd., Tokyo, both of, Japan

Filed Sep. 5, 1986, Ser. No. 903,951

Claims priority, application Japan, Sep. 9, 1985, 60-197610

Int. Cl.[4] C08L *61/00*

U.S. Cl. 524—512 3 Claims

1. A composition for electrodeposition paint, comprising (a) a water-dispersible and electrophoretic fluoropolymer obtained by neutralizing with a basic compound at least a part of the carboxyl groups of a carboxyl and hydroxyl group-containing fluoropolymer having an acid value of from 5 to 30 and a OH value of from 30 to 150 and (b) an aminoplast, which are dispersed in an aqueous medium in a weight ratio of component (a)/component (b) of from 50/50 to 97/3, wherein the aminoplast is a melamine resin, a guanamine resin or a urea resin.

4,711,927

AQUEOUS INK COMPOSITION

Mark S. Pavlin, and James C. West, both of Lawrenceville, N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 12, 1986, Ser. No. 929,458

Int. Cl.[4] C08F *255/08*

U.S. Cl. 524—531 4 Claims

1. An ink composition, which comprises:

(a) a coloring proportion of a colorant;

(b) a resin binder selected from the group consisting of the Diels-Alder adduct of maleic anhydride and a poly(alloocimene) having chain units comprised of a mixture of greater than 50 percent 2,3- and 6,7-poly(alloocimene) and less than 50 weight percent 4,7-poly(alloocimene) chain units, or the partial-esters thereof; and

(c) water in a sufficient proportion and containing a sufficient proportion of alkali or organic base to solvate the binder.

4,711,928
MOISTURE CURED ONE-PART RTV SILICONE SEALANT

Chi-long Lee, and Myron T. Maxson, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1986, Ser. No. 835,578
Int. Cl.[4] C08L *83/04*
U.S. Cl. 524—860 **8 Claims**

1. A method of producing a one-part silicone sealant stable in the absence of moisture which cures on exposure to moisture having an in situ treated filler comprising

(A) mixing

(1) 100 parts by weight of a diorganovinylsiloxy end-blocked polydiorganosiloxane where the viscosity of the siloxane is from 0.5 to 500 Pa.s at 25° C.,

(2) from 5 to 100 parts by weight of a reinforcing filler having a surface area of from about 50 to 400 m^2/g, and

(3) from 0.5 to 4.0 parts by weight of a silazane of the formula $(RR'''MeSi)_2NH$, where R is methyl, ethyl, propyl, phenyl, or trifluoropropyl, R''' is methyl or vinyl, and where, if vinyl is present, the ratio of methyl to vinyl is from 1:1 to 50:1, for each 10 parts of filler (2),

(B) heating the mixture to a temperature of 175° C., with a nitrogen, purge over the container to treat the filler,

(C) cooling, then adding

(4) sufficient silane of the formula

$$H[SiR_2OSiR_2CH_2CH_2]_bSiR_a(OR'')_{3-a}$$

where R is methyl, ethyl, propyl, phenyl or trifluoropropyl, R'' is methyl or ethyl, a is 0 or 1, and b is 0 or 1, to give a ratio of 1 to 3 mols of silane per mol of vinyl radical in polydiorganosiloxane (1),

(5) from 1 to 50 parts by weight of platinum per million parts by weight of polydiorganosiloxane (1) as platinum catalyst, then heating for from 30 to 60 minutes at a temperature of from 65° C. to 125° C., then

(D) applying a vacuum and cooling to room temperature, then

(E) admixing in the absence of moisture,

(6) from 3 to 15 parts by weight of a crosslinker of the formula

$$R'_aSi(OR'')_{4-a}$$

where R' is methyl or phenyl, R'' is methyl or ethyl, and a is 0 or 1 and

(7) from 0.2 to 2.0 parts by weight of a titanium catalyst, and

(F) storing the mixture in the absence of moisture.

4,711,929
ACRYLOURETHANE REACTION PRODUCT

Andrew P. Stamegna, Wilmington, Del., and Clifford H. Strolle, Springfield, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 712,768, Mar. 18, 1985, Pat. No. 4,659,780. This application Nov. 25, 1986, Ser. No. 934,824
Int. Cl.[4] G08F *265/02*
U.S. Cl. 525—131 **4 Claims**

1. The ungelled reaction product, by weight based on total polymer solids, of

(a) 50–70% of an acrylic prepolymer having a number average molecular weight of 2,000–10,000 and an average of 5–15, hydroxyl groups per chain, said prepolymer comprising the following monomers in percent by weight based on the prepolymer;

40–60% of one or more of butyl methacrylate or butyl acrylate

10–30% lauryl methacrylate

20–40% of one or more of hydroethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate or hydroxypropyl methacrylate, and

0–30% of one or more of styrene, methyl methacrylate and ethyl methacrylate,

(b) 20–35% of at least one of a monomeric diol and an oligomeric diol having a number average molecular weight of 200–2,000,

(c) 5–15% of an aliphatic or aromatic diisocyanate, and

(d) 1.0–4.0% of a monofunctional alcohol, said reaction being performed by first forming the acrylic prepolymer of (a) then mixing with (a) the diol of (b) and the alcohol of (d), then mixing therewith the diisocyanate of (c)

in which 5–50% of the hydroxyl groups on the acrylic prepolymer have reacted with diol or diisocyante,

which has been further reacted with enough of an anhydride to give an acid number of at least 10.

4,711,930
HONEYCOMB CATALYST AND ITS PREPARATION

Wolfgang Hoelderich; Werner Biffar, both of Frankenthal; Matthias Irgang, Heidelberg; Wolf D. Mross, Frankenthal; Michael Kroener, Mannheim, and Eberhard Ambach, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,572
Int. Cl.[4] B01J *23/84, 27/18*
U.S. Cl. 502—209 **6 Claims**

1. A honeycomb catalyst essentially consisting of catalytically active materials, said materials comprising

(a) 30 to 95% by weight, calculated as Fe_2O_3, of an iron compound;

(b) from 0.1 to 60% by weight, calculated as Al_2O_3, CeO_2 or Cr_2O_3, of an aluminum, cerium or chromium compound or a mixture of 2 or 3 of said compounds; and

(e) and (f) from 0.1 to 20% by weight, calculated as V_2O_5 or P_2O_5, of a compound of vanadium or a compound of phosphorus or a mixture of a vanadium and a phosphorus compound.

4,711,931
FLAME RETARDED POLYCARBONATE POLYMERS

Joseph Green, East Brunswick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 706,709, Feb. 28, 1985, abandoned. This application Mar. 4, 1986, Ser. No. 835,909
Int. Cl.[4] C08G *65/48*; C08L *71/04*
U.S. Cl. 525—394 **5 Claims**

1. A polycarbonate polymer composition rendered flame retardant by having combined therewith an effective amount of a phosphorus containing polyester polymer containing 3% to 9% phosphorus and having a molecular weight of up to 17,000 which is the polycondensation product of a glycol, phthalate and a phosphine oxide of the formula:

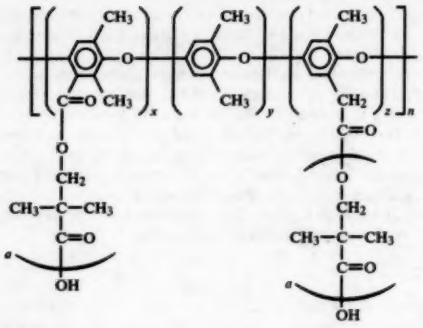
wherein R_1, may be the same or different radicals selected from the group consisting of hydrogen and methyl radicals and R_2 is a radical of 2 to 8 carbon atoms.

4,711,932
POLYETHER-POLYESTER GRAFT COPOLYMER

Vernon L. Bell, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 24, 1986, Ser. No. 855,879
Int. Cl.[4] C08L *71/04*
U.S. Cl. 525—397 **6 Claims**

1. A graft copolymer composition comprising a compound having the formula:



where n is an integer ranging from 10 to 10,000; x+y+z=1; x, y, and z are each greater than 0; m is a positive real number corresponding to the number of moles of pivalolactone consumed in the synthesis of this compound; and a is at least 1 and equal to

$$\frac{m}{(x+z)n}.$$

4,711,933

POLYETHERIMIDE ESTERS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 10, 1986, Ser. No. 928,954

Int. Cl.[4] C08G *63/76*

U.S. Cl. 525—415 **51 Claims**

1. A polyetherimide ester composition comprising the reaction products of:

(i) a mixture of at least one low molecular weight diol and at least one high molecular weight hydroxy terminated polylactone; and

(ii) a set of reactants selected from

(a) (i) at least one high molecular weight poly(oxy alkylene)diamine, and (ii) at least one tricarboxylic acid or a derivative thereof, or

(b) at least one high molecular weight polyoxyalkylene diimide diacid.

4,711,934

SELF-CROSSLINKING CATIONIC PAINT BINDERS CONTAINING UREA GROUPS AND PROCESS OF MANUFACTURE

Willibald Paar; Michael Hönel, and Johann Gmoser, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jul. 22, 1986, Ser. No. 887,934

Claims priority, application Austria, Jul. 22, 1985, 2157/85; Sep. 18, 1985, 2712/85; Sep. 25, 1985, 2786/85; Dec. 18, 1985, 3650/85; Jun. 27, 1986, 1743/86

Int. Cl.[4] C08F *40/00*; C08L *63/00*

U.S. Cl. 525—452 **14 Claims**

1. Self-crosslinking cationic paint binders, water-dilutable on protonation, comprising the reaction product of component (A) and component (B) wherein component (A) is

(A-1) an aminoalkylation product carrying an average of at least one NH-group per molecule, of a phenol compound, an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, an alkylenediamine and mixtures thereof and formaldehyde subsequently reacted with a semi-blocked diisocyanate or

(A-2) a semi-blocked diisocyanate reacted with an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, and an alkylenediamine, and the resulting substituted urea thereafter reacted with formaldehyde and a phenol compound,

and component (B) is

an epoxy compound having an epoxy equivalent weight of from about 50 to 2000 and wherein from about 50 to 100% of the phenolic hydroxy groups of component (A) are reacted with component (B) to provide a product having an amine value of at least 30 mg KOH/g.

4,711,935

SELF-CROSSLINKING CATIONIC PAINT BINDERS CONTAINING UREA AND URETHANE GROUPS AND PROCESS OF MANUFACTURE

Johann Gmoser, Radegunderstrasse; Willibald Paar, Richard Wagnergasse, and Michael Hönel, Humboldtstrasse, all of Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jul. 22, 1986, Ser. No. 887,950

Claims priority, application Austria, Sep. 16, 1985, 2689/85; Sep. 18, 1985, 2712/85; Sep. 25, 1985, 2786/85; Jun. 27, 1986, 1743/86

Int. Cl.[4] C08F *40/00*; C08L *61/06*

U.S. Cl. 525—452 **9 Claims**

1. Self-crosslinking cationic paint binders, water-dilutable on protonation, comprising the reaction product of components (A), (B), and (C) wherein component (A) is

(A-1) an aminoalkylation product carrying an average of at least one NH-group per molecule, of a phenol compound, an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, an alkylenediamine and mixtures thereof and formaldehyde subsequently reacted with a semi-blocked diisocyanate or

(A-2) a semi-blocked diisocyanate reacted with an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, and an alkylenediamine, and the resulting substituted urea thereafter reacted with formaldehyde and a phenol compound,

component (B) is a mono-1,2-epoxy compound having an epoxy equivalent weight of from about 50 to 2000, and

component (C) is a polyisocyanate,

wherein from about 50 to 100% of the phenolic hydroxy groups of component (A) are reacted with component (B) and 50 to 100 mole-% of the aliphatic hydroxy groups set free through the reaction with the mono-1,2-epoxy compound of component (B) are reacted with equivalent quantities of the polyisocyanate of component (C) to provide a product having an amine value of at least 30 mg KOH/g.

4,711,936

CURING AGENT FOR EPOXY RESIN AND METHOD FOR CURING EPOXY RESIN

Ichiro Shibanai, Tokyo, and Kenji Nakamura, Osaka, both of Japan, assignors to Japan Liquid Crystal Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00135, § 371 Date Nov. 13, 1985, § 102(e) Date Nov. 13, 1985, PCT Pub. No. WO85/04411, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 19, 1985, Ser. No. 803,289

Claims priority, application Japan, Mar. 27, 1984, 59-57462

Int. Cl.[4] C08G *59/68*

U.S. Cl. 525—485 **7 Claims**

1. A curing agent for an epoxy resin, comprising a mixture of a cyclodextrin clathrate compound of an organic compound reactive with an epoxy group, and a trace amount of amylase.

4,711,937

SELF-CROSSLINKING PAINT BINDERS AND PROCESS FOR THEIR MANUFACTURE

Willibald Paar, Graz, Austria, assignor to Vianova Kunstharz, A.G., Graz, Austria

Filed Dec. 17, 1986, Ser. No. 942,829
Claims priority, application Austria, Dec. 20, 1985, 3695/85
Int. Cl.[4] C08G 8/28; C08L 61/08
U.S. Cl. 525—489 10 Claims

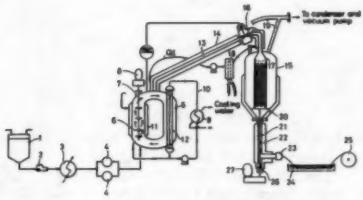
1. Self-crosslinking cationic paint binders water-dilutable upon protonation comprising the reaction product of components A-B and C wherein component A-B is the reaction product of (A) an amino alkylation product carrying an average of at least one NH-group per molecule of a phenol compound, an amino compound selected from the group consisting of a primary alkylamine, a primary alkanolamine, and an alkylenediamine, and formaldehyde subsequently reacted with a semi-blocked diisocyanate; and (B) formaldehyde wherein said formaldehyde is reacted with (A) in a maximum quantity corresponding to the number of formaldehyde reactive hydrogen sites on the phenol and urea groups of (A), and wherein component C is an epoxy compound having an epoxy equivalent weight of from about 50 to 2000, and wherein the quantity of component C is selected so that the maximum number of epoxide groups available corresponds to the sum of phenolic hydroxy groups and the methylol groups formed through the reaction with formaldehyde, said binder having basic amino groups corresponding to an amine value of at least 30 mg KOH/g.

4,711,938

PROCESS FOR PRODUCING POLYMETHYL METHACRYLATE

Motoshi Suka, 8-53, Fujimicho 3-chome, Higashimurayama-shi, Tokyo, and Shinzo Omi, Tokyo, both of Japan, assignors to Motoshi Suka, Tokyo, Japan

Filed Feb. 13, 1986, Ser. No. 829,379
Claims priority, application Japan, Feb. 19, 1985, 60-29237
Int. Cl.[4] C08F 2/02, 120/14, 220/14
U.S. Cl. 526—88 5 Claims



1. A continuous process for thermally producing polymethyl methacrylate (PMMA) or a copolymer in which methyl methacrylate (MMA) is a monomer thereof, which comprises precooling a monomeric feedstock comprising MMA or a mixture of MMA and up to 10 mol% of a monomer highly capable of forming thermal radicals, forcing the feedstock into a reactor wherein a charge consisting of the monomers and polymerization product thereof is being circulated under pressure while being cooled externally, instantaneously mixing the feedstock and the charge while cooling the charge by dint of the sensible heat of the feedstock, thoroughly mixing the charge, continuously taking out from the reactor a portion of the charge consisting essentially of unreacted feedstock and the polymerization product at a polymerization product proportion of 50% by weight or less, conducting the portion, while preheating the same, into a vacuum vessel, removing therein remaining monomer or monomers by evaporation, and thereafter recovering the polymerization product.

4,711,939

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Masafumi Imai; Tadashi Yamamoto; Hiroyuki Furuhashi; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 642,462, Aug. 20, 1984, Pat. No. 4,652,541.
This application Oct. 30, 1986, Ser. No. 924,961
Claims priority, application Japan, Aug. 30, 1983, 58-157093
Int. Cl.[4] C08F 4/64
U.S. Cl. 526—124 6 Claims

1. A process for the polymerization of olefins which comprises homopolymerizing ethylene or copolymerizing ethylene with an alpha-olefin in the presence of a catalyst system comprising

(a) a titanium containing catalyst component obtained by reacting (A) Mg(OR)(OR′) with (B) a silicon compound having at least one silicon-hydrogen bond, contacting the reaction product with (C) a carboxylic acid halide, a carboxylic acid anhydride, or mixtures thereof, and contacting the resulting contact product with a divalent, trivalent, or tetravalent titanium compound selected from titaninum halides, alkoxy titanium compounds and haloalkoxy titanium compounds, wherein R and R′ are radicals selected from alkyl, alkenyl, cycloalkyl, aryl, and aralkyl radicals and R and R′ may be the same or different

(b) and an organoaluminum cocatalyst.

4,711,940

PROCESS FOR PREPARING CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Tadashi Yamamoto; Masafumi Imai; Hiroyuki Furuhashi; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to TOA Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 705,770, Feb. 26, 1985, Pat. No. 4,654,318.
This application Oct. 29, 1986, Ser. No. 925,843
Claims priority, application Japan, Feb. 28, 1986, 59-35183
Int. Cl.[4] C08F 4/64
U.S. Cl. 526—124 14 Claims

1. A process for the polymerization of olefins which comprises polymerizing one or more olefins in the presence of a catalyst comprising

(a) a titanium containing catalyst component obtained by contacting

(i) Component A, a magnesium dialkoxide soluble in inert solvents represented by the formula Mg(OR) (OR^1) where R and R^1 are the same or different branched alkyls or alkyl substituted cycloalkyls, each R and R^1 having 7 or more carbon atoms.

(ii) Component B, a silicon compound having a hydrogen-silicon bond.

(iii) Component C, an electron donor compound, and

(iiii) a titanium compound

with the proviso that Component A, B and C are contacted with one another in an inert solvent prior to contact with the titanium compound and

(b) and organo metal compound of Groups I-III metals of the Periodic Table.

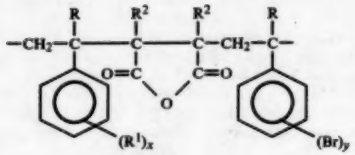
4,711,941

FLAME-RETARDANT MOLDED COMPOSITION WHICH INCORPORATES A POLY(STYRENE-CO-MALEIC ANHYDRIDE-CO-DIBROMOSTYRENE) COPOLYMER

Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Co., Los Angeles, Calif.

Division of Ser. No. 685,366, Dec. 24, 1984, Pat. No. 4,634,731.
This application Oct. 16, 1986, Ser. No. 919,737
Int. Cl.[4] C08F 12/16
U.S. Cl. 526—272 7 Claims

1. A random copolymer comprised of the following recurring units:



wherein each R separately represents —H, —CH_3, or —CH_2CH_3; R^1 represents —CH_3, —CH_2CH_3, —$CH(CH_3)_2$, —$C(CH_3)_3$, —OH, —OCH_3, —CO_2H, —$CONH_2$, or —$CON(CH_3)_2$; each R^2 separately represents —H or —CH_3; x represents an integer of from 0 to 3; and, wherein y represents an integer of from 1 to 3.

4,711,942

"LIVING" POLYMERS AND PROCESS FOR THEIR PREPARATION

Owen W. Webster, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 549,409, Nov. 7, 1983, Pat. No. 4,508,880, which is a continuation-in-part of Ser. No. 389,110, Jun. 17, 1982, Pat. No. 4,417,034, which is a continuation-in-part of Ser. No. 279,025, Jun. 30, 1981, abandoned. This application Oct. 18, 1984, Ser. No. 660,588

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.[4] C08F *4/52, 4/44, 4/16*

U.S. Cl. 526—185 **3 Claims**

1. Process of preparing a "living" polymer, the process comprising contacting under polymerizing conditions at least one polar acrylic or maleimide monomer with (i) a tetracoordinate organosilicon, organotin or organogermanium polymerization initiator having at least one initiating site, and (ii) a co-catalyst which is a source of fluoride, cyanide or azide ions or a suitable Lewis acid.

4,711,943

HYDROPHILIC SILOXANE MONOMERS AND DIMERS FOR CONTACT LENS MATERIALS, AND CONTACT LENSES FABRICATED THEREFROM

Thomas B. Harvey, III, Scottsdale, Ariz., assignor to Sola U.S.A. Inc., Phoenix, Ariz.

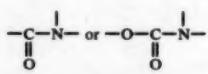
Filed Apr. 26, 1985, Ser. No. 727,501

Int. Cl.[4] C08F *130/08, 230/08*

U.S. Cl. 526—279 **73 Claims**

1. A non-fibrous polymeric contact lens material having improved oxygen permeability and stability, said polymeric contact lens material comprising a monomer having the following structural formula:

first portion for increasing wettability, said first portion being hydrophilic and including a side-chain functionality selected from the group including the following structural formulae:



and

a second portion for increasing oxygen permeability, said second portion including a siloxane;

wherein: said material has a water content of about 15–60%; DK greater than or equal to about 25×10^{-10}; tear strength greater than or equal to about 1.0 g/mm^2; and percent elongation greater than or equal to about 80%.

4,711,944

HUMIDITY RESISTANT COATING EMPLOYING BRANCHED POLYMERS OF T-BUTYL ACRYLATE

Maynard A. Sherwin, St. Albans, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 408,916, Aug. 17, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 765,692

Int. Cl.[4] C08F *220/06, 220/28, 220/54*

U.S. Cl. 526—318.42 **9 Claims**

1. A copolymer which has been produced by bulk polymerization, comprised of:

(a) from about 10 to about 95 weight percent of t-butyl acrylate;

(b) from about 0.1 to about 3 weight percent of a polyfunctional acrylate that is an ester of acrylic acid or methacrylic acid which possesses two or more ethylenically unsaturated double bonds;

(c) from about 1 to about 30 weight percent of at least one ethylenically unsaturated functional comonomer which is copolymerizable with said t-butyl acrylate and said polyfunctional acrylate, said at least one ethylenically unsaturated functional comonomer containing at least one crosslinking site selected from the group consisting of carboxyl, hydroxyl, amide and mixtures thereof;

(d) from 0 to about 80 weight percent of at least one other ethylenically unsaturated monomer which is capable of polymerizing with said t-butyl acrylate and polyfunctional acrylate.

9. A copolymer comprised of:

(a) from about 30 to about 60 weight percent t-butyl acrylate;

(b) from about 0.5 to about 2 weight percent trimethylol propane triacrylate;

(c) from about 5 to about 20 weight percent of one of acrylic acid, methacrylic acid, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl acrylate, hydroxypropyl methacrylate and mixtures thereof; and

(d) from about 5 to about 60 weight percent of other ethylenically unsaturated monomers which are capable of polymerizing with t-butyl acrylate and polyfunctional acrylates.

4,711,945

POLYKETONE

James A. Daniels, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Nov. 25, 1985, Ser. No. 801,404

Claims priority, application United Kingdom, Nov. 23, 1984, 8429609

Int. Cl.[4] C08G *65/40*

U.S. Cl. 528—86 **10 Claims**

1. A process for the preparation of an aromatic polymer which comprises

(a) effecting the condensation of at least one halophenol; or

(b) effecting the condensation of a mixture of at least one bisphenol with at least one dihalo-benzenoid compound; or

(c) effecting the condensation of (i) at least one halophenol and (ii) a mixture of at least one bisphenol with at least one dihalobenzenoid compound in the presence of at least one base and at least one copper compound wherein the base is in a stoichiometric excess relative to the phenolic groups in (a), (b) or (c), at least one of the compounds in (a), (b) or (c) is a compound containing a ketone group, and in the halophenol or the dihalo-benzenoid compound the, or each, halogen atom is activated by an inert electron-withdrawing group in at least one of the positions ortho- or para- to the halogen atom.

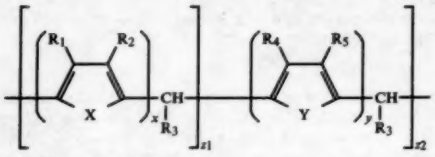
4,711,946

ELECTROACTIVE HETEROCYCLIC AROMATIC POLYMERS

Samson A. Jenekhe, Bloomington, and Marcia K. Hansen, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 8, 1986, Ser. No. 904,747
Int. Cl.[4] C08G *16/02;* H01B *1/00*
U.S. Cl. 528—251 44 Claims

1. Electroactive polymers of the structure



wherein:

X and Y are selected from S, N—H, N-lower alkyl (C=1-7), N-phenyl, O, Se or Te;

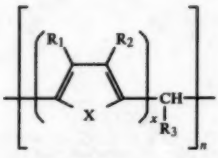
R_1, R_2, R_4 and R_5 are selected from H and lower alkyls (C=1 to 7);

R_3 is selected from the class consisting of aliphatic, aromatic and heterocyclic groups derivable from aldehydes of the formula R_3CHO;

x and y are positive integers having a value between 1 and 5;

at least one or both of Z_1 and Z_2 are positive integers having a value between 1 and 10,000.

11. Electroactive polymers of the structure



wherein:

X is selected from S, N—H, N-lower alkyl (C=1-7), N-phenyl, O, Se or Te;

R_1 and R_2 are selected from H and lower alkyls (C=1-7);

R_3 is selected from the class consisting of aliphatic, aromatic and heterocyclic groups derivable from aldehydes of the formula R_3CHO;

x is a positive integer having a value from 1 to 5; and

n is a positive integer having a value between 2 and 10,000.

4,711,947

TRANSLUCENT POLYETHERIMIDE ESTER COMPOSITIONS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Sep. 30, 1986, Ser. No. 913,397
Int. Cl.[4] C08G *63/44, 69/44*
U.S. Cl. 528—288 30 Claims

1. A translucent polyetherimide ester composition comprising the reaction products of:

(i) at least one cyclohexane dimethanol;

(ii) at least one cyclohexane dicarboxylic acid or an ester forming reactive derivative thereof: and

(iii) a set of reactants selected from

(a) (i) at least one high molecular weight poly(oxy alkylene)diamine, and (ii) at least one tricarboxylic acid or a derivative thereof, or

(b) at least one poly(oxy alkylene)diimide diacid.

4,711,948

POLYETHERIMIDE ESTERS EXHIBITING IMPROVED TENSILE ELONGATION

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Sep. 30, 1986, Ser. No. 913,395
Int. Cl.[4] C08G *63/44, 69/44*
U.S. Cl. 528—288 35 Claims

1. A polyetherimide ester composition comprising the reaction products of:

(i) a mixture of butanediol and butenediol wherein the amount of butenediol present in said mixture is less than 70 mole percent;

(ii) at least one dicarboxylic acid or an ester forming reactive derivative thereof; and

(iii) a set of reactants selected from

(a) (i) at least one high molecular weight poly(oxy alkylene)diamine, and (ii) at least one tricarboxylic acid or a derivative thereof, or

(b) at least one polyoxyalkylene diimide diacid.

4,711,949

METHOD OF CONVERTING FLUORINE-CONTAINING HIGH POLYMER INTO LOWER MOLECULAR WEIGHT POLYMER

Minoru Aramaki, and Hiroaki Sakaguchi, both of Ube, Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Nov. 13, 1985, Ser. No. 797,463
Claims priority, application Japan, Nov. 14, 1984, 59-238234; Jan. 10, 1985, 60-1461
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—356 4 Claims

1. A method of converting a fluorine-containing solid high polymer selected from the group consisting of polytetrafluoroethylene, polychlorotrifluoroethylene, poly(vinylidene fluoride), poly (vinyl fluoride), copolymers of tetrafluoroethylene and hexafluoropropylene, copolymers of tetrafluoroethylene and perfluoroalkoxyethylene and copolymers of ethylene and tetrafluoroethylene into a lower molecular weight polymer, the method comprising the step of subjecting said high polymer to contact reaction with a gas comprising at least one fluorine source material selected from the group consisting of molecular fluorine and binary compounds of fluorine and nitrogen at a temperature in the range from about 350° C. to about 500° C.

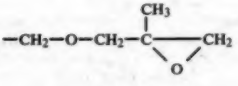
4,711,950

POLYETHER POLYMER OR COPOLYMER, MONOMER THEREFOR, AND PROCESS FOR PRODUCTION THEREOF

Katsuhito Miura, Amagasaki, and Tetsuya Nakata, Ibaraki, both of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

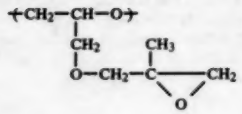
Filed Oct. 31, 1986, Ser. No. 925,270
Claims priority, application Japan, Nov. 5, 1985, 60-247712; Dec. 10, 1985, 60-278560; Jan. 20, 1986, 61-10763
Int. Cl.[4] C08G *59/02, 59/32*
U.S. Cl. 528—409 6 Claims

1. A polyether polymer or copolymer with a pendant group of the formula



in its molecule, said polymer or copolymer consisting essentially of

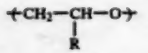
(1) 1 to 100 mole % of recurring units represented by the following formula (I)



(I)

and

(2) 0 to 99 mole % of at least one type of recurring units represented by the following formula (II)

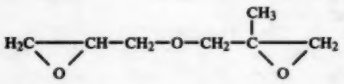


(II)

wherein R represents a member selected from the class consisting of a hydrogen atom, substituted or unsubstituted C_1–C_{18} alkyl groups, substituted or unsubstituted C_2–C_{18} alkenyl groups, substituted or unsubstituted C_3–C_8 cycloalkyl groups and substituted or unsubstituted C_6–C_{14} aryl groups,

and having a reduced viscosity η_{red}, determined at 45° C. in its 0.1% benzene solution or at 80° C. in its monochlorobenzene solution, of at least 0.01.

4. A process for producing the polyether polymer or copolymer of claim 1, which comprises polymerizing 2,3-epoxypropyl-2',3'-epoxy-2'-methylpropyl ether of the following formula (I-a)



(I-a)

or copolymerizing it with a compound the following formula (III)

(III)

wherein R represents a member selected from the class consisting of a hydrogen atom, substituted or unsubstituted C_1–C_{18} alkyl groups, substituted or unsubstituted C_2–C_{18} alkenyl groups, substituted or unsubstituted C_3–C_8 cycloalkyl groups and substituted or unsubstituted C_6–C_{14} aryl groups,

in the presence of, as a catalyst, a heat-reaction product of (A) an organotin compound and (b) a complete or partial ester compound of the formula $(HO)_3PO$, said organotin compound (A) being selected from the group consisting of compounds of the following formulae (i) to (iv)

$$R_a^1SnX_{4-a} \quad \text{(i)}$$

wherein R^1 represents a C_1–C_{12} alkyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C_1–C_{10} alkoxy and C_1–C_{10} alkylthio, a C_2–C_8 alkenyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C_1–C_{10} alkoxy, C_1–C_{10} alkylthio, and optionally substituted C_6–C_{14} aryl, a C_3–C_8 cycloalkyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C_1–C_{12} alkyl, C_1–C_{10} alkoxy, C_1–C_{10} alkylthio and optionally substituted C_6–C_{14} aryl, a C_6–C_{14} aryl group unsubstituted or substituted by a substituent selected from halogn, hydroxy, C_1–C_{12} alkyl, C_1–C_{10} alkoxy, C_1–C_{10} alkylthio and optionally substituted C_6–C_{14} aryl, or a C_7–C_{18} aralkyl group unsubstituted or substituted by a substituent selected from halogen, hydroxy, C_1–C_{12} alkyl, C_1–C_{10} alkoxy and C_1–C_{10} alkylthio; x represents an atom or group selected from halogen atoms, C_1–C_{12} alkoxy groups, aryloxy groups having C_6–C_{14} aryl, acyloxy groups having C_2–C_{12} acyl and residues of partial esters of phosphoric acid; and a is an integer of 1 to 4, provided that when a is an integer of 2 to 4, R^1 groups may be identical or different, and when a is 1 or 2, the X's may be identical or different;

$$R_b^1SnO_c \quad \text{(ii)}$$

wherein R^1 is as defined with regard to formula (i), b is 1 or 2, and when b is 1, c is 3/2 or when b is 2, c is 1, the compound of formula (ii) may form a complex with the compound of formula (i);

$$R^2—R_2^1SnOSnR_2^1—R^2 \quad \text{(iii)}$$

wherein R^1 is as defined with regard to formula (i), R^2 is as defined with regard to R^1 and X, and the two R^2 groups may be identical and different; and

$$(R_3^2Sn)_dX' \quad \text{(iv)}$$

wherein R^2 is the same as defined with regard to formula (iii) provided that at least one of the three R^2 groups is a group selected from the groups defined for R^1 in formula (i); X' is a member selected from the group consisting of a carbonate group, a phosphorus or oxyacid group, a polybasic carboxylic acid group and a residual moiety of a polyhydric alcohol; and d is a number greater than 1 and corresponds to the basicity of the member X'.

4,711,951

THERAPEUTICALLY ACTIVE COMPOUND AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Rolf E. A. V. Axén, and Jan P. E. Carlsson, both of Uppsala, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

Continuation of Ser. No. 364,675, Apr. 2, 1982, abandoned. This application Mar. 29, 1984, Ser. No. 594,981

Claims priority, application Sweden, Apr. 6, 1981, 8102194

Int. Cl.[4] C07K *5/02, 7/02*

U.S. Cl. 530—323 **12 Claims**

1. The method for prolonging the activity of organic base compounds of polypeptide structure having known therapeutic activity, which known compounds contain

(a) one or more carboxy groups, and/or

(b) one or more primary and/or secondary amino groups, and/or

(c) one or more SH-groups and/or inner —S—S— bridges such method of prolonging the activity comprising substituting a group comprising the structure —S'—S''—R for the groups (a) or (b) or transforming one of the groups of (c) into the structure —S'—S''—R, wherein R is selected from the group consisting of

(1) 2-benzothiazolyl,

(2) 5-nitro-2-pyridyl

(3) 2-pyridyl

(4) 4-pyridyl

(5) 5-carboxy-2-pyridyl and

(6) the N-oxides of any of (2) to (5)

and S' is bound to an aliphatic carbon atom, such substitution or transformation having no profound negative effects on therapeutical activity.

4,711,952

SERUM THYMIC FACTOR PEPTIDE ANALOGS AND PROCESS FOR THE PREPARATION THEREOF

Evzen Kasafirek; Martin Cerny; Petr Kocis; Jiří Krepelka, all of Prague, and Jozef Rovensky, Piestany, all of Czechoslovakia, assignors to SPOFA, spojene podniky pro zdravotnickou vyrobu, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 810,030, Dec. 17, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 875,230

Claims priority, application Czechoslovakia, Dec. 17, 1984, 9887-84

Int. Cl.[4] C07K *7/06, 7/48*

U.S. Cl. 530—327 10 Claims

1. Serum thymic factor peptide analog of the general formula I

A-Gly-Gly-Ser-Asn-B-C-NH-R (I),

in which A is pGlu, Gln, Ala-Lys-Ser-Gln, pGlu-Ala-Lys-Ser-Gln or Gln-Ala-Lys-Ser-Gln, B and C are the same or different and are each Gly, Phe, Leu, Ala or a direct bond, and R is H, an alkyl with 1 to 6 carbon atoms or a 2-phenylethyl group.

4,711,953

PROCESS FOR OBTAINING AN ALPHA-LACTALBUMIN ENRICHED PRODUCT FROM WHEY AND USES THEREOF

Loïc Roger, Rennes; Jean-Louis Maubois, La Barre-Guibourg; Gérard Brulé, Rennes, and Michel Piot, Rennes, all of France, assignors to Institut De La Recherche Agronomique, Paris, France

Continuation of Ser. No. 647,069, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 338,136, Jan. 8, 1982, Pat. No. 4,485,040, which is a continuation of Ser. No. 162,641, Jun. 24, 1980, abandoned. This application Jul. 9, 1986, Ser. No. 883,019

Claims priority, application France, Jun. 26, 1979, 79 16482

Int. Cl.[4] C07K *3/26*

U.S. Cl. 530—366 16 Claims

1. A process for obtaining an alpha-lactalbumin enriched product from sweet whey, comprising:

(a) adjusting the pH of the whey to about 6.6, whereby a pH-adjusted whey is obtained;

(b) subjecting the pH-adjusted whey to a first ultrafiltration at a temperature in the range of 45°–60° C. on a membrane having a molecular weight cut-off adopted to retain soluble proteins, whereby a first ultrafiltrate is obtained;

(c) separating the first ultrafiltrate;

(d) subjecting the first ultrafiltrate to a second filtration on a membrane having a molecular weight cut-off adapted to retain alpha-lactalbumin and whereby a retentate is formed; and

(e) collecting the retentate.

4,711,954

3-THIENYLAZO DYES WITH A GAMMA-ACID COUPLER

Holger Heidenreich, Cologne, and Gerhard Wolfrum, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,047

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510410

Int. Cl.[4] C09B *29/033, 29/30;* D06P *1/39, 3/24*

U.S. Cl. 534—780 4 Claims

1. An azo dyestuff of the formula

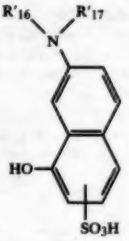
wherein

R_1' stands for CN, COOX' or CONH2'

R_2' stands for hydrogen, C_1–C_4-alkyl, or phenyl which is unsubstituted or substituted 1 to 3 times by C_1–C_4-alkyl, CL or C_1–C_4-alkoxy or substituted once by SO_3H,

R_3' stands for C_1–C_4-alkyl or phenyl which is unsubstituted or substituted 1 to 3 times by C_1–C_4-alkyl, Cl or C_1–C_4-alkoxy or substituted once by SO_3H,

K' stands for a radical of the formula



wherein

R'_{16} is hydrogen, C_1–C_4-alkyl, cyclohexyl or phenyl which is unsubstituted or substituted 1 to 3 times by C_1–C_4-alkyl, Cl or C_1–C_4-alkoxy or substituted once by SO_3H,

R'_{17} is hydrogen or C_1–C_4-alkyl, and

X' denotes cyclohexyl or C_1–C_4-alkyl.

4,711,955

MODIFIED NUCLEOTIDES AND METHODS OF PREPARING AND USING SAME

David C. Ward, Guilford, Conn.; Pennina R. Langer, Monsey, N.Y., and Alexander A. Waldrop, III, Charlottesville, Va., assignors to Yale University, New Haven, Conn.

Continuation of Ser. No. 255,223, Apr. 17, 1981, abandoned. This application May 23, 1983, Ser. No. 496,915

Int. Cl.[4] C07H *17/02, 19/06, 19/02*

U.S. Cl. 536—29 21 Claims

1. A nucleotide or oligo- or polynucleotide sequence comprising at least one of a moiety having the structure:

wherein B represents a 7-deazapurine or a pyrimidine moiety;

wherein A represents a moiety selected from the group consisting of biotin and iminobiotin;

provided that if B is a 7-deazapurine, A is attached to the 7-position of the deazapurine, and if B is a pyrimidine, A is attached to the 5-position of the pyrimidine, A being attached to B directly or through a linkage group, said linkage group not interfering substantially with the characteristic ability of A to form a detectable complex with one of avidin, streptavidin or antibodies to biotin or iminobiotin.

4,711,956

PENICILLIN DERIVATIVES

Ivanka A. Atanassova; Marieta A. Haimova; Vesselina B Chavdarova, all of Sofia; Anton I. Nakov; Nedelcho G. Petkov, both of Razgrad, and Ruska S. Avramova, Sofia, all of Bulgaria, assignors to TPO "Pharmachim", Sofia, Bulgaria

Filed Jul. 17, 1985, Ser. No. 756,018

Int. Cl.[4] C07D *499/76, 499/46*

U.S. Cl. 540—327 22 Claims

1. Sodium salt of 6-[2'-methyl-1'(2'H)-isoquinolinone-4'-carboxylamide]-2,2-dimethyl-penam-3-carboxylic acid.

4,711,957

SYNTHESIS OF 2-KETO-1,4-DIAZACYCLOALKANES

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 57,238, Jul. 13, 1979, Pat. No. 4,297,497, which is a continuation-in-part of Ser. No. 916,640, Jun. 19, 1978, Pat. No. 4,167,512, which is a continuation-in-part of Ser. No. 835,066, Sep. 21, 1977, abandoned. This application Jul. 18, 1981, Ser. No. 274,996

Int. Cl.[4] C07D *241/44, 241/18, 241/38, 403/08*

U.S. Cl. 544—231 3 Claims

1. A method for preparing a polysubstituted 2-keto-1,4-diazacycloalkane trans-isomer, comprising dissolving a trans-1,2-diaminocycloakane in water, adding a predetermined amount of an α-hydroxy fatty acid nitrile selected from the group consisting of aliphatic cyanohydrins, araliphatic cyanohydrins, and cycloaliphatic cyanohydrins to form an aqueous mixture, heating said mixture to cause reactants in said mixture to form said trans-isomer, and recovering said trans-isomer from said mixture.

4,711,958

MORPHOLINE CONTAINING AMINO ACID DERIVATIVES

Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota; Kenji Akahane, all of Nagano; Hideaki Umeyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Nagano, Japan

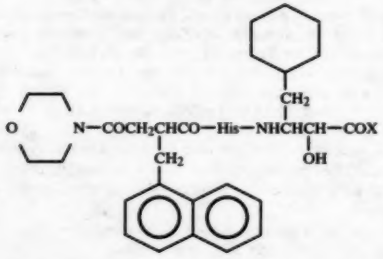
Filed Apr. 1, 1987, Ser. No. 32,693

Claims priority, application Japan, Apr. 1, 1986, 61-74511; Jul. 10, 1986, 61-162563

Int. Cl.[4] C07D *295/18*

U.S. Cl. 544—139 3 Claims

1. Amino acid derivatives represented by formula (I):



wherein His represents an L-histidyl group, X represents a straight or branched alkoxy group having 1 to 7 carbon atoms, a straight or branched alkylamino group having 1 to 7 carbon atoms, a cycloalkyloxy group having 3 to 7 carbon atoms, a morpholino group, said alkoxy group having one or more halogen atoms as substituents; or a pharmaceutically acceptable salt.

4,711,959

2-CYANOAMINO-PYRIMIDINES

Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Duesseldorf, and Theodor Pfister, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

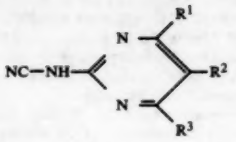
Filed Jul. 11, 1986, Ser. No. 884,710

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3525977

Int. Cl.[4] C07D *239/42, 239/47, 239/46*

U.S. Cl. 544—320 12 Claims

1. A process for the preparation of a 2-cyanoamino-pyrimidine of the formula



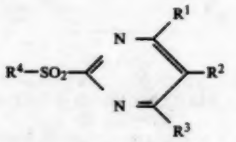
in which

R^1 is hydrogen, halogen, optionally substituted alkyl or optionally substituted alkoxy,

R^2 is hydrogen, alkyl or halogen, and

R^3 is hydrogen, halogen, optionally substituted alkyl or optionally substituted alkoxy,

comprising reacting a 2-alkylsulphonyl-pyrimidine of the formula



in which

R^4 is optionally substituted alkyl, with cyanamide or with a metal salt of cyanamide at a temperature between 0° and 150° C.

4,711,960

ISOCHROMANS

John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 718,199, Apr. 1, 1983, Pat. No. 4,577,021, which is a continuation of Ser. No. 26,719, Apr. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 847,350, Oct. 31, 1977, abandoned. This application Jan. 28, 1986, Ser. No. 823,343

Int. Cl.[4] C07D *405/04*

U.S. Cl. 544—364 2 Claims

1. A compound selected from the group consisting of

4-phenyl-1-[2-(3,4-dihydro-6,7-dimethoxy-4-methyl-1H-2-benzopyran-1-yl)ethyl]piperazine;

4-phenyl-1-[2-(3,4-dihydro-6,7-dimethoxy-4-methyl-1H-2-benzopyran-1-yl)ethyl]piperazine, dihydrochloride;

4-(3-chlorophenyl)-1-[2-(3,4-dihydro-6,7-dimethoxy-4-methyl-1H-2-benzopyran-1-yl)ethyl]piperazine;

4-(2-chlorophenyl)-1-[2-(3,4-dihydro-6,7-dimethoxy-4-methyl-1H-2-benzopyran-1-yl)ethyl]piperazine;

4-(2-chlorophenyl)-1-[2-(3,4-dihydro-6,7-dimethoxy-4-methyl-1H-2-benzopyran-1-yl)ethyl]piperazine, dihydrochloride;

4-phenyl-1-[3-[1-(4-fluorophenyl)-3,4-dihydro-6,7-dimethoxy-4-methyl-1H-2-benzopyran-1-yl]propyl]piperazine; and

4-phenyl-1-[3-[1-(4-fluorophenyl)-3,4-dihydro-6,7-dimethoxy-4-methyl-1H-2-benzopyran-1-yl]propyl]piperazine, monohydrochloride.

4,711,961

BENZISOSELENAZOLETHIONES AND PROCESS FOR THE TREATMENT OF VARIOUS DISEASES IN HUMANS

André Welter; Sigurd Leyck, both of Pulheim, and Eugen Etschenberg, Cologne, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

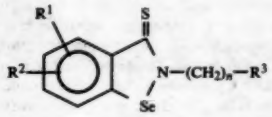
Filed Feb. 26, 1985, Ser. No. 705,672

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407511

Int. Cl.[4] C07D *293/12*

U.S. Cl. 548—121 4 Claims

1. Benzisoselenazolethiones of the general formula I



I

wherein R^1 and R^2 which can be identical or different, independently of one another are members selected from the group consisting of hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl and nitro, and, R^1 and R^2 together, methylenedioxy, n is zero or an integer from 1 to 4, R^3 is a member selected from the group consisting of hydrogen, unsubstituted phenyl, the phenyl groups monosubstituted and those disubstituted by a member selected from the group consisting of halogen, alkyl, alkoxy, trifluoromethyl, nitro and methylenedioxy, and the heterocyclic groups selected from the group consisting of the unsubstituted thiophene, thiazole, isothiazole, imidazole, pyrazole, thiadiazole, pyridine, pyrimidine, pyrazine, pyridazine, benzothiazole, benzimidazole, benzotriazine, benzothiophene, benzothiadiazole, triazine, triazole, tetrazole, quinoline, isoquinoline, indole and indazole groups and such groups being monosubstituted by a member of the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, mercapto, C_1–C_4-alkylmercapto, phenyl, nitro and trifluoromethyl, and such groups being identically or differently disubstituted by a member of the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, mercapto, C_1–C_4-alkylmercapto, phenyl, nitro and trifluoromethyl.

4,711,962

PROCESS FOR SELECTIVE PREPARATION OF RATIOS OF ISOMERS FORMED ON N-SUBSTITUTION OF ASYMMETRIC IMIDAZOLES

Andrea Leone-Bay, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

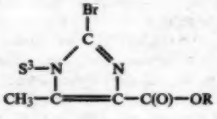
Continuation-in-part of Ser. No. 662,009, Oct. 18, 1984, Pat. No. 4,595,400, and a continuation-in-part of Ser. No. 730,964, May 6, 1985, Pat. No. 4,571,257. This application Oct. 2, 1985, Ser. No. 782,676

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

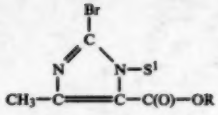
Int. Cl.[4] C07D *233/90*

U.S. Cl. 548—337 35 Claims

1. A process for selectively preparing a mixture of two compounds C3A and C3B, wherein C3A is a regioisomer of C3B, and wherein C3A is an asymmetric imidazole derivative having the structural formula:



and C3B has the structural formula:



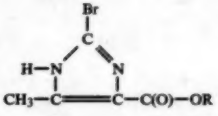
wherein:

S^1 or S^3 is C_1–C_{10} alkyl or C_3–C_{10} allyl or cyanoethyl; or C_1–C_{10} alkoxymethyl or C_1–C_{10} thiomethyl or C_1–C_{10} sulfoxymethyl or C_1–C_{10} sulfonomethyl; and

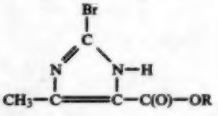
R is C_1–C_{10} alkyl; C_3–C_8 cycloalkyl; C_3–C_8 cycloalkylalkyl, wherein the alkyl has 2 to 8 carbon atoms; allyl or 2-methyl-3-butenyl-1; C_5–C_8 cycloalkyl; benzyl or mono- or disubstituted benzyl, wherein the substituent is C_1–C_4 alkyl, halogen, nitro or C_1–C_4 haloalkyl

which comprises the steps of:

(1) reacting a tautomeric mixture of two compounds, C1A and C1B, with an equimolar amount of a base, B, in the presence of a solvent, S, thereby forming a mixture of two compounds C2A and C2B, wherein C2A is a salt of C1A and B; and C2B is a salt of C1B and B; and C1A has the structural formula:



and C1B has the structural formula:



wherein:

R is as previously defined;

B is a hydride of an alkali metal or an alkaline earth metal, M, or mixtures thereof:

S is a tetrahydrofuran solvent;

thereby forming a mixture of regioisometric salts, C2A and C2B, and hydrogen; and then

(2) adding a preselected amount of an N-substituting agent, ZS^3, selected from an alkylating agent, an alkenylating agent, or a cyanoethylating agent to the mixture of regioisometric salts C2A and C2B;

wherein:

S^3 is as previously defined; and,

Z is selected from alkyl, aryl, sulfonyl, alkoxyalkyl, benzyl, haloalkyl, and thioalkyl;

thereby forming a mixture of C3A and C3B in a ratio, r, of percentage amounts C3A/C3B within the range from 50/50 to 100/0.

4,711,963

4-AMINO-2-METHYL-3-PHENYL-1-(2,4,6-TRICHLOROPHENYL)-3-PYRAZOLIN-5-ONE

Yoshio Inagaki, and Tadao Shishido, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

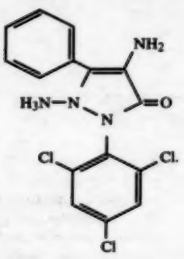
Continuation-in-part of Ser. No. 459,028, Jan. 18, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 858,830

Claims priority, application Japan, Jan. 18, 1982, 57-6606

Int. Cl.[4] C07D *231/46*

U.S. Cl. 548—365 6 Claims

1. 4-amino-2-methyl-3-phenyl-1-(2,4,6,-trichlorophenyl)-3-pyrazolin-5-one represented by the following formula (1):



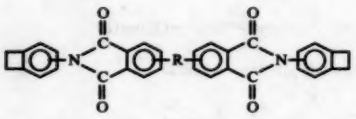
4,711,964
BISDIENE FROM BIS-BENZOCYCLOBUTENE COMPOUND

Loon-Seng Tan, and Fred E. Arnold, both of Centerville, Ohio, assignors to University of Dayton, Dayton, Ohio

Filed May 8, 1986, Ser. No. 861,020
Int. Cl.[4] C07D *209/48*
U.S. Cl. 548—461 10 Claims

1. A compound of the formula

(I)



where R is divalent linking group.

4,711,965
PREPARATION OF ALKYL SILANES

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 24, 1987, Ser. No. 17,852
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—478 6 Claims

1. Process for the preparation of a tetralkylsilane having the formula:

wherein R and R′ alkyl radicals and the radicals R′ are alike or different, such that R has up to about 4 carbon atoms, and each radical designated by R′ has from about 8 to about 14 carbon atoms; said process comprising contacting reactants (a) and (b) wherein:

(a) is an alkali metal aluminum tetraalkyl having the formula $MAlR'_4$, wherein M is lithium, sodium, or potassium, and R′ has the same significance as above, and

(b) is an alkyltrihalosilane having the formula $RSiX_3$, wherein X is a halide radical selected from fluoride, chloride and bromide, and R has the same significance as above;

said process being conducted such that the mole ratio of reactant (a) to reactant (b) is from about 0.75 to 1.0, to about 1 to 1, and the reaction temperature is from about 180° C. to about 230° C.

4,711,966
PREPARATION OF ALKYL SILANES

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 19, 1987, Ser. No. 27,897
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—478 8 Claims

1. A process for preparing a product composition comprising a compound having the formula $RSiR'_3$ wherein R is a lower alkyl radical of 1–4 carbon atoms, and each R′ is an alkyl radical of from about 8 to about 14 carbon atoms,

said process comprising reacting (a) a silicon tetrahalide having the formula SiX_4, wherein each X is a halide radical selected from the class consisting of fluoride, chloride and bromide, with (b) a trialkylaluminum R_3Al, and (c) an alkali metal aluminum tetraalkyl $MAlR'_4$ reactant, wherein M is selected from lithium, sodium, or potassium,

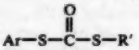
said process being conducted at a temperature of from about 80° C. to about 230° C., and such that for each mole portion of SiX_4, there is employed about a $\frac{1}{3}$ mole portion of R_3Al, and about a $\frac{2}{3}$ mole portion of $MAlR'_4$.

4,711,967
PRODUCTION OF S-ARYL S-ALKYL DITHIOCARBONATES

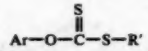
Peter G. Urben, Kenilworth, United Kingdom, assignor to Courtaulds PLC, London, England

Filed Apr. 28, 1986, Ser. No. 856,505
Claims priority, application United Kingdom, May 2, 1985, 8511143
Int. Cl.[4] C07C *154/02*
U.S. Cl. 558—243 9 Claims

1. A process for the preparation of an S-aryl S-alkyl dithiocarbonate of the formula



where Ar is a phenyl or naphthyl group which may be substituted, and R′ is an alkyl group, wherein an O-aryl S-alkyl dithiocarbonate of the formula



where Ar and R′ are as previously stated is pyrolytically isomerised at a temperature in the range from 200° to 600° C. to produce said S-aryl S-alkyl dithiocarbonate.

4,711,968
PROCESS FOR THE HYDROFOMYLATION OF SULFUR-CONTAINING THERMALLY CRACKED PETROLEUM RESIDUA

Alexis A. Oswald, Clinton Township, Hunterdon County, N.J., and Ram N. Bhatia, Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham, N.J.

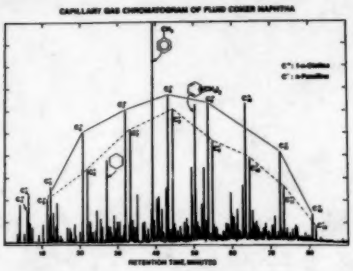
Filed Oct. 3, 1986, Ser. No. 914,802
Int. Cl.[4] C07C *45/50*
U.S. Cl. 568—454 31 Claims

1. A hydroformylation process comprising

reacting an olefinic cracked petroleum distillate feed produced from petroleum residua by high temperature thermal cracking, and containing 1-n-olefins as the major type of olefin components and organic sulfur compounds in concentrations exceeding 0.1 percent sulfur with carbon monoxide and hydrogen

at temperatures between about 50° and 250° C. and pressures in the range of 50 and 6000 psi

in the presence of a Group VIII transition metal carbonyl complex catalyst in effective amounts



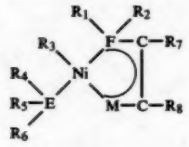
to produce aldehydes and/or alcohols of semilinear character having an average of less than one alkyl branch per molecule.

4,711,969
OLIGOMERIZATION OF ETHYLENE IN METHANOL AND WATER

David L. Beach, Kingwood, Tex., and James J. Harrison, Novato, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 25, 1986, Ser. No. 900,204
Int. Cl.[4] C07C 2/32
U.S. Cl. 585—511 **28 Claims**

1. A process for oligomerizing ethylene to normal alpha olefins and recovering said olefins from the reaction product which comprises reacting ethylene in a methanol-water mixture containing 0.5 to 20 wt % water under oligomerization conditions in contact with a nickel ylide defined by the following formula:



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about 1 to about 24 carbon atoms, aryl radicals having from about 6 to about 20 carbon atoms, alkenyl radicals having from about 2 to about 30 carbon atoms, cycloalkyl radicals having from about 3 to about 40 carbon atoms, aralkyl and alkaryl radicals having from about 6 to about 40 carbon atoms, halogen radicals, hydroxyl, alkoxy and aryloxy groups, and hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy groups, provided that at least one of each R_1 to R_8 radicals is a sulfonato group or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl carrying a sulfonato group, M is sulfur or oxygen, E is phosphorus, arsenic, antimony or nitrogen and F is phosphorus, arsenic or antimony, to obtain a reaction product containing (A) a methanol-water phase having dissolved therein said nickel ylide and (B) an alpha olefin phase and then separating said phases from each other to recover said alpha olefin phase.

4,711,970
CATALYTIC CONVERSION

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 493,192, May 10, 1983, Pat. No. 4,576,805, which is a continuation-in-part of Ser. No. 412,362, Aug. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 333,369, Dec. 22, 1981, abandoned. This application Jan. 8, 1986, Ser. No. 818,967
Int. Cl.[4] C07C 2/00
U.S. Cl. 585—415 **25 Claims**

1. A process for converting a feedstock comprising C_2+ olefins, C_2–C_7 paraffins or a mixture thereof to conversion product comprising C_5+ hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a porous inorganic crystalline composition of enhanced cation exchange capacity prepared by a method for increasing the total amount of lattice metal in the framework of a porous inorganic crystalline composition comprising 98 mole percent or more SiO_2 and 2 mole percent or less oxides of at least one initial lattice metal selected from those of Groups IIIB, IVB, VIB, VIIB and VIII of the Periodic Table of the Elements and having anhydrous anionic framework molar composition expressed by the formula

$$(1-x)SiO_2:(x)MO_{n/2}$$

wherein x is less than or equal to 0.02, M is said initial lattice metal and n is the valance of M, which method comprises contacting in an anhydrous system said crystalline composition at a temperature of from about 100° C. to about 850° C. with a volatile compound comprising at least one metal to be coordinated in the framework of said crystalline composition for a time sufficient to increase the total amount of lattice metal in the framework of said crystalline composition wherein said total amount is greater than the amount of said initial lattice metal prior to said contacting, said volatile compound comprising said metal having a radius ratio of less than about 0.6 and a size and shape which permits said volatile compound to enter the pores of said crystalline composition at the contacting temperature,

converting said volatile compound contacted inorganic crystalline composition to the hydrogen or hydronium form,

and recovering said porous inorganic crystalline composition of enhanced cation exchange capacity.

4,711,971

THERMOELECTRIC SI-GE ALLOY COMPOSITION

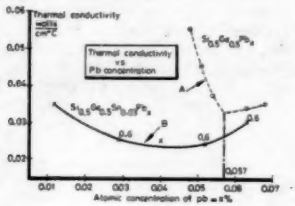
William Duncan, and Arthur J. Barlow, both of Glasgow, Scotland, assignors to The University Court of the University of Glasgow, Glascow, Scotland

Filed Dec. 5, 1985, Ser. No. 805,507

Claims priority, application United Kingdom, Dec. 8, 1984, 8431071

Int. Cl.[4] H01L *35/20*; C22C *28/00*

U.S. Cl. 136—211 19 Claims



1. A thermoelectric alloy composition consisting essentially of from 5% to 95% of silicon, from 95% to 5% germanium, from 0.01% to 0.2% lead and from 0% to 0.2% of tin, all percentages being atomic percentages.

4,711,972

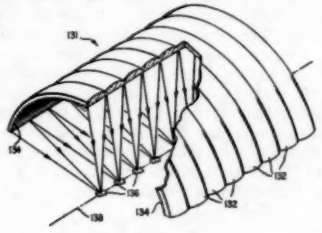
PHOTOVOLTAIC CELL COVER FOR USE WITH A PRIMARY OPTICAL CONCENTRATOR IN A SOLAR ENERGY COLLECTOR

Mark J. O'Neill, Richardson, Tex., assignor to Entech, Inc., DFW Airport, Tex.

Continuation-in-part of Ser. No. 752,023, Jul. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 653,148, Sep. 24, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,261

Int. Cl.[4] H01L *25/02*

U.S. Cl. 136—246 23 Claims



1. A radiant energy converter for converting radiant energy into electrical energy, the converter having a focal zone, comprising:

(a) primary optical concentrator including focusing means having a preselected configuration and receiving incident radiant energy for focusing the energy onto the focal zone;

(b) one or more photovoltaic cells individually located in the area of the focal zone, each of the cells having active material and a pattern of electrically-conducting elements positioned on and obscuring a portion of the active material, the active material for receiving the radiant energy and in response thereto generating an electrical signal; and

(c) a cell cover for each of the cells, said cell cover having one or more refractive elements, each having a geometry selected to be compatible with the preselected configuration of the focusing means of the primary optical concentrator and further determined by the pattern of electrically conducting elements positioned on the active areas of the cells, said cell cover receiving the focused radiant energy from over a wide angular distribution from the primary optical concentrator depending on the location of the cell in the focal zone and the preselected configuration of the focusing means of the primary optical concentrator and in response thereto refracting the radiant energy away from the pattern of electrically conducting elements and onto the active area of the cells not obscured by the conducting elements.

4,711,973

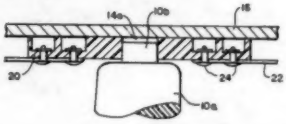
GAS INSULATED TRANSMISSION LINE WITH SIMPLIFIED INSULATOR ASSEMBLY AND METHOD OF ASSEMBLING SAME

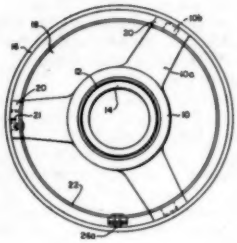
Jeffry R. Meyer, Penn Hill Township, Allegheny County, Pa.; Albert P. Munroe, Southborough, Mass., and Philip C. Bolin, Wilkins, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1987, Ser. No. 20,043

Int. Cl.[4] H02G *5/06*

U.S. Cl. 174—14 R 8 Claims





1. A gas insulated transmission line comprising:

a cylindrical outer sheath;

an inner conductor disposed within said outer sheath;

an insulating gas electrically insulating said inner conductor from said outer sheath;

support means for insulatably supporting said inner conductor within said outer sheath, said support means comprising a solid insulator having an inner portion attached to said inner conductor and an outer portion;

a bearing block of insulating material fitting together with said outer portion of said solid insulator and having a lower dielectric constant than said insulator, said bearing block having a sliding relation with said outer sheath; and,

a metal particle trap circumferentially disposed coaxially with said outer sheath and attached to said block at locations removed from said insulator.

8. A method of assembling a gas insulated transmission line comprising the steps of:

providing a central conductor with at least one support insulator, extending radially therefrom;

forming a cylindrical particle trap by wrapping a flexible metal sheet material;

fitting a bearing block of insulating material onto an extremity of said support insulator without use of metal hardware;

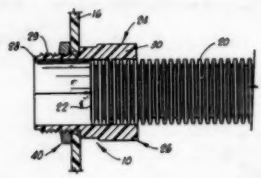
fastening said particle trap to said bearing block at points spaced from said support insulator;
fastening an electrical contact to said particle trap; and
sliding said inner conductor supported on said support insulator and bearing block into an outer metal sheath.

4,711,974

ADAPTER FITTING FOR CONNECTING FLEXIBLE CONDUIT TO ELECTRICAL OUTLET BOXES

Richard J. Borsh, Chagrin Falls, Ohio, assignor to The Carlon Company, Cleveland, Ohio

Continuation of Ser. No. 665,304, Oct. 26, 1984, Pat. No. 4,616,105. This application Apr. 30, 1986, Ser. No. 857,842
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.[4] F16L *3/02*
U.S. Cl. 174—65 R **1 Claim**



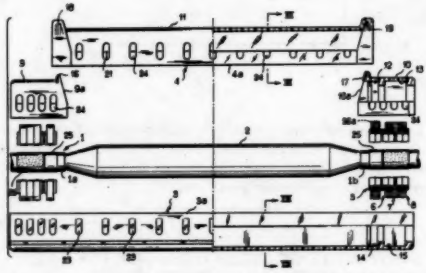
1. An electrical conductor protective system comprising, in combination:
an electrical outlet box having at least one side wall defining a substantially circular opening through the one side wall and into the interior of the box;
an adapter fitting projecting through the circular opening through the side wall of the box and interlocked with said side wall, said adapter fitting including:
a pair of semi-cylindrical fitting halves each having a concave inner side and a convex outer side, and having a first end and having a second end, each of said two fitting halves further including:
a neck portion terminating at said first end and extending through the circular opening in the side wall of the box;
means preventing the neck portion from moving through said opening beyond a certain specific degree of passage therethrough;
a conduit-receiving portion extending from said neck portion to the second end of said fitting half, and having an external surface of greater diameter than the external diameter of said neck portion;
a pair of opposed, axially extending, substantially monoplanar, smooth, parallel, uninterrupted side edges extending from the first end thereof to the second end thereof, said side edges in each of said pairs lying in a common plane and slidingly abutting the pair of side edges of the other of said fitting halves whereby said semi-cylindrical fitting halves may be slid axially relative to each other as said opposed side edges slide against each other to thereby axially offset one of the fitting halves relative to the other and thereby cause said neck portion of one said semi-cylindrical fitting halves to project a shorter distance into said electrical outlet box than the other of said neck portions projects thereinto to facilitate connecting electrical conductors to terminals within said electrical outlet box;
a radially inwardly projecting, circumferentially extending rib carried on the concave inner side of the respective fitting half; and
a flexible, synthetic resin corrugated conduit including a plurality of contiguous circular ridges each separated from the two adjacent circular ridges by a pair of grooves, at least one of said grooves receiving one of said radially inwardly projecting ribs to retain said corrugated conduit interlocked with said adapter fitting in a preselected position relative to said box.

4,711,975

PROTECTIVE SLEEVE AND A METHOD FOR PROTECTING CABLE SPLICES

Jacques Morel, Fontaine Les Ribouts, and Didier Morel, Favieres, both of France, assignors to Etablissements Morel - Ateliers Electromecaniques de Favieres, Chateauneuf En Thymerais, France

Filed May 12, 1986, Ser. No. 863,828
Claims priority, application France, May 31, 1985, 85 08219
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—92 **15 Claims**



1. A sleeve for protecting cable splices in particular for telephone cables, comprising at least two half-shells (3, 4) to be assembled together along their longitudinal edges (3*a*, 4*a*) around at least one cable splice (2), opposite ends of the sleeve being provided with separate jaws (5, 6, 7, 8) held together by the half-shells for radially clamping and axially retaining two cable ends (1*a*, 1*b*) which are to be connected by means of the splice (2), means for forming a tight seal between the at least two half-shells (3, 4), between the cable ends (1*a*, 1*b*) and the jaws and between the at least two half-shells and the jaws, one of the half-shells (3) being formed in one piece, the second half-shell (4) having two end elements (9, 10) for covering the clamping jaws (5, 6, 7, 8), thereby to realize a tight seal between the cable ends (1*a*, 1*b*) and the jaws (5, 6, 7, 8) and between the jaws, the respective end elements (9, 10) and the lower half-shell, and a central element (11) separate from said end elements (9, 10), which is adapted to be placed between the at least two end elements and oovers the edges (9*a*, 10 *a*) of said end elements which are adjacent to it, thereby to realize a tight seal between the half shells (3, 4).

13. A method for protecting a cable splice in particular for a telephone cable by means of a sleeve comprising at least two half-shells (3, 4) to be assembled together along their longitudinal edges (3*a*, 4*a*) around at least one cable splice (2), opposite ends of the sleeve having separate jaws (5, 6, 7, 8) held together by the half-shells for radially clamping and axially retaining two cable ends (1*a*, 1*b*) which are connected by means of the splice (2), means being provided for forming a tight seal between the at least two half-shells (3, 4), between the cable ends (1*a*, 1*b*) and the jaws, and between the at least two half-shells and the jaws, one of the half-shells (3) being formed in one piece, wherein the second half-shell (4) is provided with two end elements (9, 10) for covering the clamping jaws (5, 6, 7, 8), thereby to realize a tight seal between the cable ends (1*a*, 1*b*) and the jaws (5, 6, 7, 8) and between the jaws, the respective end elements (9, 10) and the lower half-shell and a central element (11), separate from said end elements (9, 10), which is to be placed between the at least two end elements, thereby to realize tight seal between the half-shells (3, 4), wherein said method comprises the following steps:

placing a first series of jaw elements (5*a*, 6*a*, 7*a*, 8*a*) at the opposite ends of the first half-shell (3);

placing two cable ends (1*a*, 1*b*) which have not yet been joined together on the corresponding jaw elements located at each end of the half-shell (3);

placing a second series of jaw elements (5*b*, 6*b*, 7*b*, 8*b*) on the cable ends (1*a*, 1*b*) opposite to the first series of jaw elements;

covering said second series of jaw elements by the two end elements (9, 10) of the second half-shell and fixing said end elements on said first half-shell (3);

forming a splice (2) between the two cable ends;

placing the central element (11) of the second half-shell between the two end elements (9, 10) aforesaid and on the first half-shell (3), and then fastening together these components.

4,711,976
DATA TRANSMISSION FACILITY

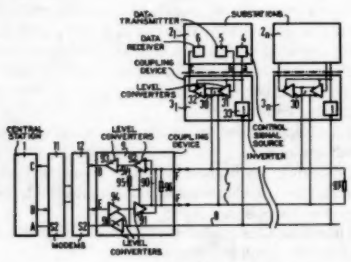
Ferdinand Narjes, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,094

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444361

Int. Cl.[4] **H04Q** *1/30*; **H04L** *15/00*

U.S. Cl. 178—2 C **9 Claims**



1. A data transmission facility comprising:

a data bus;

a central station for transmitting and receiving data including a transmitting output and a receiving input;

a first level converter device connected between said transmitting output, said receiving input and said data bus, said first level converter device comprising a transmitting level converter, a receiving level converter and a control input connected to said level converters for receiving first and second control signals, said level converters responsive to said first control signal to condition said first level converter device for the transmission of data from said transmitting output to said data bus and responsive to said second control signal to condition said first level converter device for passing data received from said data bus to said receiving input;

a plurality of substations each including a data transmitter and a data receiver;

a plurality of second level converter devices each connected between a respective substation and said data bus, each of said second level converter devices comprising a transmitting level converter, a receiving level converter and a control input for receiving said first and second control signals, and responsive to said first control signal to condition said second level converter device to pass data received from said data bus to said data receiver and responsive to said second control signal to condition said second level converter device to pass data from the respective data transmitter to said data bus; and

control signal means connected to said control signal inputs of said first and second level converter devices and operable to produce said first and second control signals.

4,711,977
ELECTRONIC BLACKBOARD APPARATUS

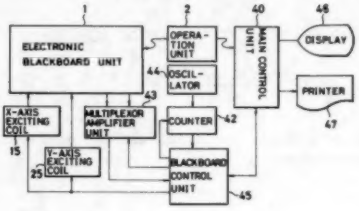
Nobuyuki Miyamori; Yoshiaki Tomofuji; Kiyosato Izawa, and Youichi Tsuchida, all of Kuki, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

Filed Jan. 9, 1987, Ser. No. 1,740

Claims priority, application Japan, Jan. 9, 1986, 61-2736; Jan. 24, 1986, 61-13515

Int. Cl.[4] **G08C** *21/00*

U.S. Cl. 178—18 **5 Claims**



1. An electronic blackboard apparatus, comprising:

an electronic blackboard unit having a surface plate made of a non-magnetic material, the surface of which is formed as a writing surface capable of being used repeatedly, and a position-detecting tablet for detecting position coordinates of a local magnetic bias applied via said surface plate;

a writing instrument having a core member for displaying video information including characters and figure on said writing surface and a magnetism generator for applying a magnetic bias to said position-detecting tablet when said core member is in contact with said writing surface;

an eraser having an erasing member for erasing said video information including said characters and figure on said writing surface and a magnetism generator for applying a magnetic bias to said position-detecting tablet when said erasing member is in contact with said writing surface;

a position detecting control unit for driving said position-detecting tablet and for computing the position coordinates of said writing instrument and said eraser; and

an output section for outputting said video information of said writing surface.

4,711,978
SULFUR HEXAFLUORIDE CIRCUIT-BREAKER FOR OPERATING IN A VERY LOW TEMPERATURE ENVIRONMENT

Robert Jeanjean, St-Lambert; Daniel Demissy, Montreal; Guy Saint-Jean, Longueuil, and Michel Landry, Ste-Julie, all of Canada, assignors to Cegelec Industrie Inc., Lapraire, Canada

Filed Jan. 29, 1987, Ser. No. 8,446

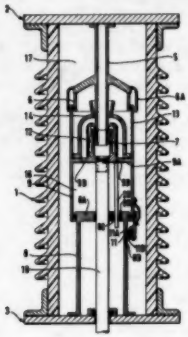
Claims priority, application France, Jan. 29, 1986, 86 01252

Int. Cl.[4] **H01H** *33/88*

U.S. Cl. 200—148 A **4 Claims**

1. In a sulfur hexafluoride circuit-breaker for operating in a very low temperature environment, the circuit-breaker comprising a sealed enclosure closed by first and second end plates and filled with sulfur hexafluoride, a set of fixed contacts, a set of moving contacts driven by an operating rod, means including a moving assembly coupled to said operating rod for defining a blast volume which is mechanically compressed when the operating rod is displaced to open the circuit-breaker contacts, and a blast nozzle for directing said compressed gas from said volume onto the arc, the improvement comprising means including two parts constituting two electrodes for creating an

arc in said blast volume during a portion of the time that the moving assembly is moving, by diverting the current to be



interrupted so that it flow through said two parts constituting said two electrodes.

4,711,979

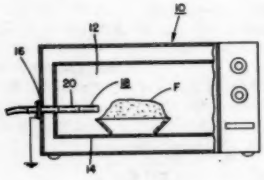
MICROWAVE OVEN VIDEO VIEWING DEVICE

George M. Glasser, Irvington; Robert P. DeRobertis, Mahopac; John H. Smithwrick, Mt. Vernon, and William J. Kelly, Tarrytown, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 27, 1986, Ser. No. 834,090

Int. Cl.[4] H05B *6/76*

U.S. Cl. 219—10.55 D **13 Claims**



1. An arrangement for the internal viewing of the preparation of a food product or the like in a microwave oven; comprising a telescopable tubular member insertable through an aperture in a wall of said microwave oven so as to position the leading end of said tubular member in proximity to the food product in said microwave oven; a generally cylindrical optical viewing device being inserted in said tubular member in coaxially concentric relationship therewith, said viewing device having an outer diameter which is smaller than the inner diameter of said tubular member to form an annular space therebetween; at least one ring-shaped apertured disc extending transversely in the space between said viewing device and said tubular member for radially supporting said device within said tubular member; and a mesh structure being positioned in said tubular member to extend transversely in front of the leading end of said viewing device in said microwave oven so as to form a radiation screen inhibiting the leakage of microwave radiation therethrough.

4,711,980

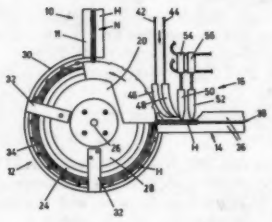
NAIL COLLATOR AND WELDER

Walter H. Leistner, Willowdale, Canada, assignor to Sigma Tool & Machine Limited, Scarborough, Canada

Filed Feb. 18, 1986, Ser. No. 829,989

Int. Cl.[4] B23K *11/00;* **B65B** *19/34, 35/58;* **B65G** *47/24*

U.S. Cl. 219—56 **5 Claims**



1. Apparatus for forming nails into a nailing strip for use with nails having nail heads, each having a registering formation for registering with the shank of an adjacent nail, in which such nails are welded to at least one wire, said nails extending diagonally to said strip with the registering formation of each said nail head registering with the shank of an adjacent nail, said apparatus comprising:

a nail feed mechanism for feeding said nails with their nail heads arranged in a random orientation;

a nail indexing and transfer wheel receiving said nails from said nail feed mechanism and indexing them into predetermined nail spacings;

a nail handling slide mechanism for receiving said nails from said indexing and transfer wheel;

rotation means associated with said nail indexing and transfer wheel and comprising friction means for engaging said nails to rotate said nails as said indexing and transfer wheel moves them from said nail feed mechanism to said nail handling slide to bring said heads into a predetermined orientation and holder means for holding said nails in said predetermined orientation once their heads have been rotated into said predetermined orientation;

pusher means operable to push said nails from said nail indexing and transfer wheel and into and along said slide mechanism in strip disposition therein with the shank of each said nail registering with the registering formation of the head of an adjacent nail, and with said shanks of said nails lying on parallel axes which extend diagonally to the axis of said strip;

at least one wire feed means for feeding said at least one wire to one side of said nails in said nail handling slide, said at least one wire extending along an axis parallel to the axis of said strip and diagonally to said shanks of said nails;

electrical welding contact means for contacting said at least one wire and pressing the same sequentially against each said nail and passing a welding current therethrough sufficient to weld said at least one wire to said nail; and

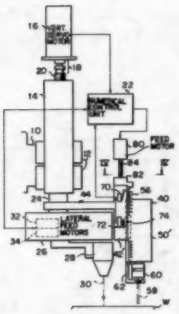
movement means for moving said welding contact means towards and away from said nails in said nail handling slide, said pusher means being operable to move said nails along said nail handling slide in timed relation to the operation of said welding contact means whereby to sequentially weld said at least one wire to each said nail so to from said nailing strip.

4,711,981

COMBINED WIRE ELECTRODE ELECTRICAL DISCHARGE MACHINE AND INITIAL HOLE FORMING DEVICE

Toshiyuki Aso, and Tamotu Ishibashi, both of Hino, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00176, § 371 Date Dec. 3, 1985, § 102(e) Date Dec. 3, 1985, PCT Pub. No. WO85/04608, PCT Pub. Date Oct. 24, 1985
PCT Filed Apr. 8, 1985, Ser. No. 815,090
Claims priority, application Japan, Apr. 7, 1984, 59-68378
Int. Cl.[4] B23H 7/02
U.S. Cl. 219—69 W 7 Claims



1. A wire electrode electrical discharge machine including an initial hole forming device comprising:

an electrical discharge machine having wire guiding means for guiding a wire electrode, said machine including vertical feed means for vertically moving the wire guiding means toward and away from a workpiece and a lateral feed mechanism supported on said vertical feed means for laterally moving said wire guiding means;

frame means attached to said vertical feed means to be vertically moved thereby;

an initial hole forming head attached to the frame means so as to be vertically slidable relative to the frame means, said initial hole forming head being provided at the lower end thereof with a rotary chuck for holding a hollow bar electrode;

operating means for vertically shifting said initial hole forming head on said frame means between a first initial hole forming position near said wire guiding means and a second resting position to which said initial hole forming head is retracted upward from said first initial hole forming position;

position detecting means on said frame means for detecting positions of said initial hole forming head and providing detection signals indicating positioning of said initial hole forming head and each of said first and second positions; and

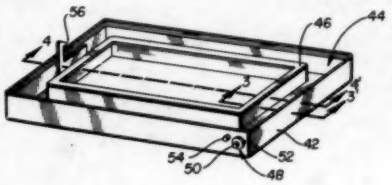
control means responsive to said detection signals and operative to inhibit operation of said lateral feed mechanism of said wire guiding means while a detection signal provided by said position detecting means indicates that said initial hole forming head is positioned at said first position, and to permit operation of said lateral feed mechanism of said wire guiding means when a detection signal indicates that said initial hole forming head is positioned at said second position.

4,711,982

PLASTIC MICROWAVE OVEN DOOR

Ronald W. Millman, Bloomington, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 30, 1986, Ser. No. 869,212
Int. Cl.[4] H05B 6/64
U.S. Cl. 219—10.55 D 26 Claims



1. A microwave oven door structure comprising:

a unitary frame circumscribing a central viewing aperture and formed of a plastic material having a channel cross-section adapted to face a microwave oven cavity opening;

a microwave-impermeable viewing window positioned across the central viewing aperture secured to said frame to permit visual inspection of the interior of a microwave oven cavity; and

a hinge means formed as a single piece with said frame for pivotally connecting one side of the frame to a microwave oven;

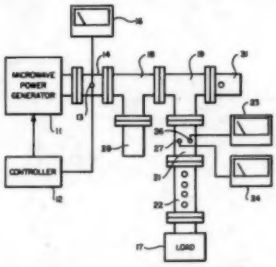
wherein the frame channel is provided with a microwave impermeable coating.

4,711,983

FREQUENCY STABILIZED MICROWAVE POWER SYSTEM AND METHOD

John E. Gerling, 1648 Kansas Ave., Modesto, Calif. 95351

Filed Jul. 7, 1986, Ser. No. 882,223
Int. Cl.[4] H05B 6/70
U.S. Cl. 219—10.55 A 9 Claims



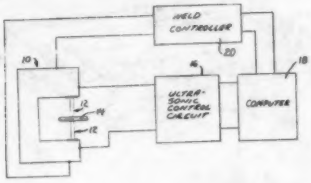
1. In a system for applying different levels of microwave power to a work load at a substantially constant frequency from a microwave power source which operates at different frequencies at different power levels: a dummy load, means for applying microwave power from the source to the dummy load and to the work load, and means for varying the relative amounts of the microwave power delivery to the dummy load and to the work load to adjust the amount of power delivered to the work load without changing either the level at which the source operates or the frequency of the power delivered to the work load.

4,711,984

ULTRASONIC METHOD AND APPARATUS FOR SPOT WELD CONTROL

Umit Bilge, Clawson; August F. Scarpelli; Ronald E. Schwartz, both of Warren, all of Mich., and John J. Ross, Dunedin, Fla., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 9, 1987, Ser. No. 23,250
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—110 **5 Claims**



1. The method of controlling a resistance spot weld comprising the steps of:

transmitting ultrasonic pulses between spot weld tips during a weld cycle,

measuring the transit time of the ultrasonic pulses to obtain weld progress information, the transit time of each pulse being a function of temperature and nugget growth,

determining the rate of change of transit time from the transit times of at least two pulses,

comparing the rate of change of transit time to a preset range during the early portion of the weld cycle and, when there is a discrepancy, adjusting the weld current to conform the measured rate to the preset range, and

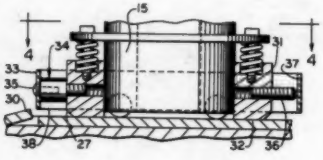
comparing the rate of change of transit time to a preset rate during a later portion of the weld cycle and, when the measured rate falls below the preset rate, terminating the weld current.

4,711,985

INTERFERENCE DETECTOR FOR LASER CUTTING MACHINE

James R. Wilkerson, Morrow, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 24, 1986, Ser. No. 946,264
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LB **3 Claims**



1. In a coordinate laser cutting machine having: means for supporting sheet stock in a work plane; a laser beam focusing unit and nozzle oriented to direct a laser cutting beam normal to said work plane, said nozzle being positionable proximal to said sheet stock; and means for moving said sheet stock in a plurality of directions along said work plane while said nozzle is positioned proximal to said sheet stock, a protection device for said nozzle, comprising:

a circular nozzle ring of conductive material, carried by said nozzle proximal to said sheet stock;

a deflectable circular spring ring of conductive material, concentrically affixed to said circular nozzle ring by at least one radial standoff, said circular spring ring biased to form a non-conductive gap between said circular nozzle ring and said circular spring ring;

electric power source means connected to said circular nozzle ring and said circular spring ring for generating an electric signal when said circular nozzle ring and said circular spring ring contact each other; and

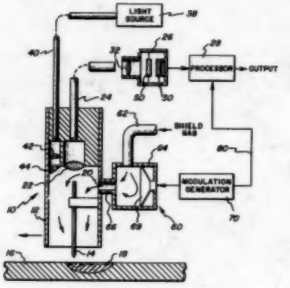
means responsive to said electric signal for automatically inhibiting machine movement when said circular nozzle ring and said circular spring ring contact each other.

4,711,986

METHOD AND APPARATUS FOR MEASURING WELD PENETRATION IN AN ARC WELDING PROCESS

Robert D. Lillquist, Schenectady, and Allen W. Case, Jr., Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,522
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—130.01 **17 Claims**



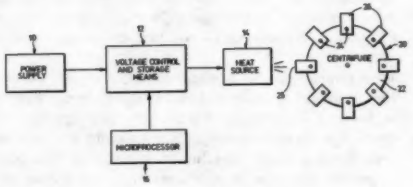
1. An apparatus for continuously monitoring an arc welding process in which an electrical current forms an arc between an electrode of a moving welding torch and a workpiece to create a weld pool in the workpiece, the apparatus comprising optical means on said welding torch for sensing light reflected from the pool at a non-specular angle and for providing a signal representative of the light sensed; means for exciting the pool at a plurality of different frequencies so as to induce spatial oscillations in the pool; and means responsive to the signal from the sensing means for determining the natural frequency of oscillation of the pool and detecting the transition from partial to full penetration of said weld pool.

4,711,987

HEAT SOURCE CIRCUITRY FOR BIOLOGICAL MATERIAL ANALYSIS

G. Thomas Ritter, Palatine, and Mitchell Budniak, Skokie, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 1, 1985, Ser. No. 707,720
Int. Cl.[4] H05B *3/00*; G01N *25/00*
U.S. Cl. 219—358 **18 Claims**



2. An apparatus, adapted for heating samples of biological material to be analyzed, having a rotatable surface comprising:

a plurality of mounting means, spaced about the periphery of said rotatable surface, each adapted to carry a sample of biological material which may be at a different temperture;

a heat source located adjacent said rotatable surface adapted to convert electrical energy into heat;

an electrical power supply for producing an electrical output;

electrical storage means, coupled between said heat source and said power supply, adapted to convert said electrical output into stored electrical energy for subsequent application to said heat source, the electrical storage means producing a storage capacity signal representative of the amount of electrical energy stored in said electrical storage means;

signal control means adapted to receive the storage capacity signal and to produce a control signal to control the application of said electrical output to said electrical storage means;

amplitude control means for regulating the control signal to determine the amount of electrical energy stored in the electrical storage means;

means adapted to develop a positioning signal when a selected sample of said biological material is moved into proximity of said heat source;

triggering means, coupled to said heat source, adapted to cause said stored energy to applied to said heat source upon generation of said positioning signal so that said heat source converts said stored elecrical energy into heat and applied said heat to said selected sample of said biological material as said sample is moved past said heat source so that each sample may be raised to a respective temperature; and

signal control disable means for preventing the further application of said electrical output to said electrical storage means when said stored electrical energy is applied to said heat source.

4,711,988

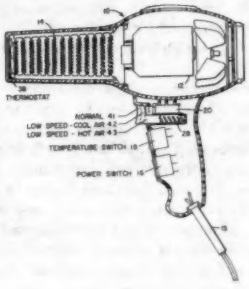
ELECTRIC HAIR DRYER WITH MULTI-MODE SWITCH FOR AIR TEMPERATURE AND FLOWRATE CONTROL

Arnold Thaler, Plantation, Fla., and P. C. Yip, Kowloon, Hong Kong, assignors to Windmere Corporation, Hialeah, Fla.

Filed Oct. 1, 1985, Ser. No. 782,386

Int. Cl.[4] H05B *1/02*; A45D *20/00*; F24H *3/04*

U.S. Cl. 219—364 **19 Claims**



1. A hair dryer comprising: blower means for generating a current of air through the hair dryer; heater means for heating said current of air; mode switch means and associated circuitry for controlling said heater means and said blower means to operate in a plurality of modes, said mode switch means being actuated by a single button for selecting each of said modes, said plurality of modes includes a first mode wherein said heater means generates heat at a first heating rate and said blower means generates a current of air at a first flow rate, and a second mode wherein said heater means generates heat at a second heating rate lower than said first heating rate and said blower means generates a current of air having a second flow rate which is less than or equal to the first flow rate.

4,711,989

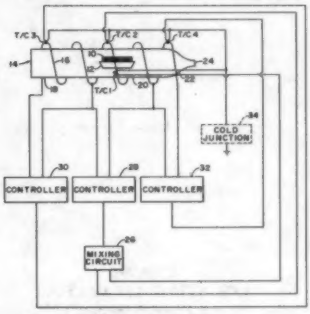
DIFFUSION FURNACE MULTIZONE TEMPERATURE CONTROL

Chorng-Tso Yu, Placentia, Calif., assignor to Thermco Systems, Inc., Orange, Calif.

Filed May 19, 1986, Ser. No. 864,676

Int. Cl.[4] H05B *3/64*

U.S. Cl. 219—390 **6 Claims**



1. A method for recovering the atmospheric temperature in a multi-zone diffusion tube containing a freshly loaded batch of wafers, said tube having resistance heating elements disposed around its periphery, comprising the steps of:

(a) providing at least one central zone between a load end zone and a source end zone;

(b) loading a batch of wafers into the central zone;

(c) heating the tube atmosphere toward a predetermined temperature;

(d) sensing the temperature of a heating element in the central zone;

(e) sensing the temperature of the tube atmosphere in the central zone;

(f) controlling the heat input to the heating elements disposed around the central zone in response to a ratio average of the sensed temperatures of the heating element in the central zone and the tube atmosphere in the central zone.

4,711,990

CERAMIC HEATER

Hiroki Hoshizaki; Nobuaki Kawahara, both of Anjo; Hirofumi Suzuki, Kariya, and Kazuo Oyobe, Ohbu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 7, 1986, Ser. No. 816,868

Claims priority, application Japan, Jan. 11, 1985, 60-3459

Int. Cl.[4] H05B *3/10*; H01B *1/06*

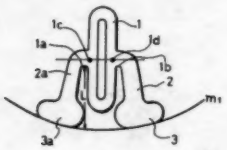
U.S. Cl. 219—552 **8 Claims**

1. A ceramic heater capable of being cantilevered comprising:

heat generating means having a closed loop portion and two leg portions integrally connected to said closed loop portion at two connecting portions which approximately bisect the closed loop portion;

two electrode portions being provided at fore ends of said

two leg portions respectively and being disposed in the same plane constituted by said closed loop portion;



said closed loop portion and said two electrode portions conjointly forming a triangle.

4,711,991

COUNTING APPARATUS

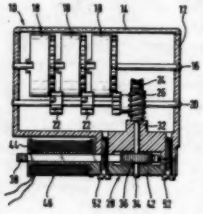
Andreas Haller; Werner Pfundstein, both of VS-Schwenningen, and Heinrich Hall, VS-Villingen, all of Fed. Rep. of Germany, assignors to IVO Irion & Vosseler Zahlerfabrik GmbH & Co., Schwenningen, Fed. Rep. of Germany

Filed Jan. 7, 1987, Ser. No. 1,222

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 8600748[U]

Int. Cl.⁴ G06F *15/18*

U.S. Cl. 235—132 E **7 Claims**



1. A counting apparatus comprising:

(a) a drum counting mechanism comprising a gear, rotatable indicating drums,

the gear drivingly connected with one of said drums, and switching drives for decadic indexing of other indicating drums;

(b) a step motor for driving said counting apparatus including a stator coil,

a magnet yoke,

a rotor driven by said magnet yoke and having a rotor shaft,

means drivingly connecting said rotor shaft to said gear, and

(c) a housing for said drum-counting mechanism including a wall, said wall forming a part of a housing for said step motor, another part of the step motor housing having an extending portion, said stator coil being around and on said extending portion.

4,711,992

ELECTRONIC INSTRUMENT

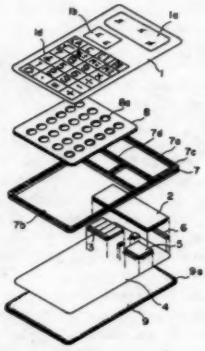
Kazumi Sekine, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 728,161, Apr. 30, 1985, Pat. No. 4,567,354, which is a continuation-in-part of Ser. No. 525,211, Aug. 22, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,175

Claims priority, application Japan, Aug. 30, 1982, 57-149170

Int. Cl.⁴ G06C *7/02*; H01H *9/26*

U.S. Cl. 235—145 R **7 Claims**



1. An electronic instrument, comprising:

solar battery means for converting light energy into electric energy;

display means for displaying information;

an upper member having front and back sides, said upper member comprising a flexible sheet, said solar battery means and said display means being mounted in the region of said back side, said upper member further having a first portion permitting light to be incident on said solar battery means and a second portion permitting information displayed on said display means to be perceived from the exterior of said instrument, said upper member further comprising at least one key symbol;

a circuit substrate having an area smaller than that of said upper member and comprising a circuit pattern including at least one fixed contact, corresponding to said at least one key symbol, used for key input;

an integrated circuit element connected to said at least one fixed contact;

movable contact means positioned between said upper member and said circuit substrate, a key input to said integrated circuit element being obtained by contact of said movable contact means with said at least one fixed contact;

spacing means normally for maintaining said movable contact means spaced from said at least one fixed contact of said circuit substrate when said at least one key symbol of said upper member is not depressed and for permitting said movable contact means to contact said at least one fixed contact of said circuit substrate to produce a key input when said at least one key symbol is depressed;

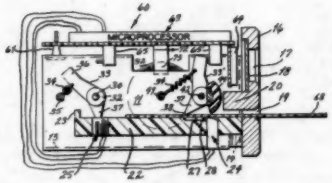
a lower member provided at a position to sandwich said circuit substrate between at least a portion of said lower member and at least a portion of said upper member, said lower member having a recessed area formed within the periphery thereof, said recessed area receiving said circuit substrate, said solar battery means, said display means and said spacing means within the height of said lower means; and

means for adhesively securing said upper member to the periphery of said lower member.

4,711,993
FRAUD-RESISTANT MANUAL MAGNETIC READER-WRITER SYSTEM FOR DEBIT CARD USE

Joseph F. Kosednar, 2030 Seven Pines Dr., Creve Coeur, Mo. 63041, and Merlyn W. Barth, 729 W. Lockwood, Glendale, Mo. 63122

Continuation-in-part of Ser. No. 568,384, Jan. 5, 1984, Pat. No. 4,599,510. This application May 20, 1985, Ser. No. 736,113
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **11 Claims**



1. For accepting commands for transactions involving debiting the amount of credit encoded on a magnetic stripe card which if valid is also encoded with a validity indication,

a manual card reader-writer comprising

means to establish a linear path for card insertion and reading, and a co-linear path for card writing and withdrawal,

means to fix a rest position at the end of such card reading path,

card sensor means to respond when such card has reached such rest position,

means including card read head means, effective on card movement along such path for insertion, to read and store in memory such credit amount and such validity indication, if the latter be present,

means, effective on such response of the card sensor means and on completion of such storage in memory, to eradicate at least such validity indication,

means to output from memory and display at least the credit amount so read and stored,

means to receive an external command to debit such credit amount, and to accept such command if not in excess of the credit amount then present and if such a validity indication has been stored, and to calculate a revised credit balance effective on such acceptance and to substitute same in the storage and display, and

means including card write head means, effective on withdrawal movement of such card out of said rest position and along said write path, to recall out of storage such credit balance as revised and write same on such card in place of the original credit amount, and thereafter, if a validity indication has been so stored, to rewrite such stored validity indication and cancel all such storage,

whereby should a user manage to remove a card without rewriting its credit balance out of storage, such card would lack a validity indication and be incapable of reuse.

4,711,994
SECURITY SYSTEM FOR CORRELATING PASSENGERS AND THEIR BAGGAGE

Joel S. Greenberg, Princeton, N.J., assignor to Princeton Synergetics, Inc., Princeton, N.J.

Filed Jan. 17, 1986, Ser. No. 819,805
Int. Cl.[4] G06F *15/26*; G06K *19/06*
U.S. Cl. 235—384 **12 Claims**

1. A security system for maintaining a close surveillance over both passengers and their baggage to be loaded aboard a public conveyance, comprising:

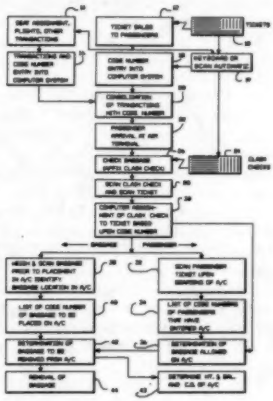
a passenger ticket having a uniquely distinctive, machine readable code number printed thereon, for issuance to an airline ticket agent or travel agency;

a baggage claim check having a tag portion and a receipt portion, both portions having a uniquely distinctive, similarly machine readable code number printed thereon, for issuance to baggage handlers;

means for initially recording and storing the ticket and claim check code numbers, to indicate the airline ticket agent or travel agency to whom the ticket was issued and to indicate the baggage handler to whom the claim check was issued;

means for recording and storing the code number printed on the ticket, when the ticket is issued to a passenger;

means for recording and storing the code number printed on the claim check, when the tag portion thereof is affixed to baggage, at the time the passenger presents baggage to be checked in;



means for re-recording and re-storing the passenger ticket code number, at the time the passenger presents the baggage to be checked in, to identify and associate each passenger with specifically identified baggage;

means for again recording and storing the ticket code number, as the passenger boards the conveyance, to identify and confirm the presence of each passenger aboard the conveyance;

a first list of passengers who have boarded the conveyance generated by the storage means;

a second list of identified baggage associated with a specific boarded passenger generated by the storage means; and

the second list indicating which of the baggage is or is not allowed to be loaded aboard the conveyance.

4,711,995
ELECTRONIC KEY CODE RECORDING DEVICE

Leonard J. Genest, 1331 E. Edinger St., Santa Ana, Calif. 92705

Filed Jul. 10, 1986, Ser. No. 884,132
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—449 **8 Claims**

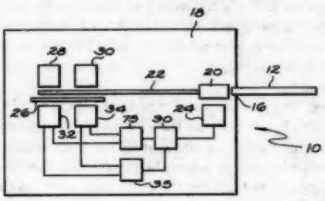
1. A device for recording a code on a key which is used for electronic locks, the recording device comprising:

a housing having an opening for receiving the key;

a first trasparent material having a series of alternate opaque lines and transparent spaces, said first transparent material being stationary in said housing;

a second transparent material having a series of alternate opaque lines and transparent spaces, said second transparent material being adjacent and parallel to said first transparent material, said second transparent material being adapted to be moved with respect to said first transparent material by the insertion of the key through said opening; and

means for recording the code on the key as a function of distance traveled by the key as the key is inserted through



said opening, said recording means being permanently positioned in said housing.

4,711,996

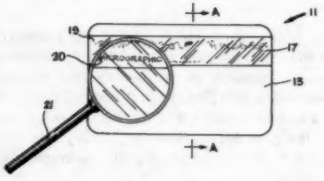
REDUNDANT OPTICAL RECORDING OF INFORMATION IN DIFFERENT FORMATS

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 693,856, Jan. 22, 1985, which is a continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Apr. 9, 1985, Ser. No. 721,382 The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—468 **28 Claims**



1. A method for recording information in situ on a card comprising,

disposing at least one strip of optical contrast direct-read-after-write laser recording material in a carrier and

recording information indicia onto said strip, in situ, by means of a laser, at least some of said information indicia being microscopically eye readable information, the other information being machine readable information, the eye readable information being redundant with at least some of the machine readable information.

4,711,997

OPTICAL INTERCONNECTION OF DEVICES ON CHIPS

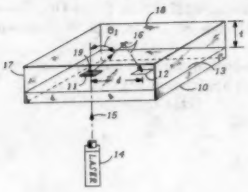
David A. B. Miller, Fair Haven, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 14, 1986, Ser. No. 930,672

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—216 **6 Claims**

1. In combination, a chip having at least one optical source for providing a light beam out of said chip and at least one optical detector for receiving light coupled to said chip at a point that is spatially remote from said optical source, diffracting means fabricated in material grown over said optical source for directing a light beam from said optical source along a predetermined path, and means positioned a predetermined



distance from said diffracting means for reflecting the directed light beam to said optical detector.

4,711,998

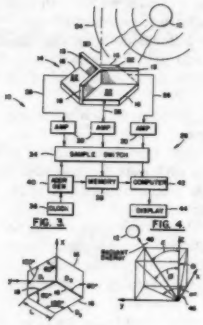
DIRECTION FINDER SYSTEM WITH MIRROR ARRAY

Fritz J. Malek, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 5, 1985, Ser. No. 804,720

Int. Cl.[4] G01B *11/26*

U.S. Cl. 250—203 R **5 Claims**



1. A direction finder system comprising:

an array of three radiation detectors and three mirrors disposed between the detectors, said detectors being positioned in a plane about a central axis of the array for detecting an incoming wave of radiant energy from a source of the radiant energy located in a sector of space including said central axis, each of said detectors producing a signal upon detection of an incident wave of the radiant energy;

each of said mirrors having front and back reflecting surfaces for reflection of the radiant energy upon individual ones of said detectors located before and behind the mirror, said mirrors lying in planes which intersect at and include said central axis thereby to extend forward of the plane of said detectors for interception of rays of radiation directed towards the plane of said detectors, said interception of rays by a mirror introducing a shading of one of said detectors during a reflection of radiation upon a second of said detectors;

the strength of each signal depending on the orientation of a radiation-receiving surface of the corresponding detector and the orientation of reflecting surfaces of adjoining mirrors relative to the direction of propagation of said wave, including increments in signal strength introduced by reflection and shading functions of the mirrors; and

means for combining the signals of said detectors to obtain the direction of a source of said wave, said combining being based on a continuously variable ratio of signals of respective ones of said detectors to accomplish normalization of respective ones of the detector signals.

4,711,999

APPARATUS FOR PHOTOMETRICALLY DETECTING AN OPTICALLY FOCUSED CONDITION OF AN OPTICAL SYSTEM

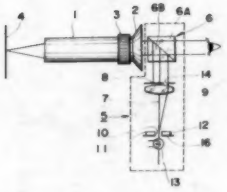
Yoshio Shishido, Fuchinobe Sagamihara; Susumu Takahashi, Hachioji; Kazumasa Matsuo, Tama; Atsushi Miyazaki, Hachioji; Shinichi Nishigaki, Hachioji; Shinichi Kato, Hachioji; Takeaki Nakamura, Hino, and Akibumi Ishikawa, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 500,964, Jun. 3, 1983, abandoned. This application Jan. 14, 1987, Ser. No. 5,282

Claims priority, application Japan, Jun. 5, 1982, 57-96534; Jun. 5, 1982, 57-96535

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—204 6 Claims



1. An apparatus for photometrically detecting a focused condition of an image-forming optical system having a first optical axis, comprising:

light projection means for projecting a definitely-shaped beam of light into an object to be imaged;

means for conducting light reflected from said object along said first optical axis of said image-forming optical system;

beam-splitting means arranged along said first optical axis of said image-forming optical system for partially deflecting said light being reflected from said object along said first optical axis along a second ptical axis and for providing a first light path along said second optical axis;

aperture means provided at a location eccentrically of said second optical axis for providing a second light path intersecting said first light path at a point along said second optical axis; and

light-receiving means having first and second sides arranged along said second optical axis at a fixed location therealong corresponding to a focal position along said first optical axis of said image-forming optical system and including at least two photoelectric sensor means on said first side having respective photoelectric surfaces thereof arranged perpendicularly to said second optical axis and having a gap between said two photoelectric sensor means for projecting light from said light projecting means through said gap of said light-receiving means, said light projecting means being positioned on said second side of said light-reciving means,

wherein a focused condition of said image-forming optical system may be detected photometrically by said light-receiving means in accordance with comparison of respective outputs of said at least two photoelectric sensor means.

4,712,000

ROTARY ENCODER WITH SOURCE-ADJACENT LIGHT SAMPLING AND CONTROL

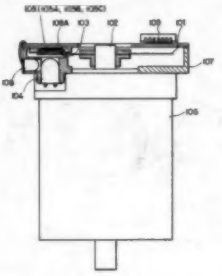
Junichi Yoshikawa, and Masahiro Rachi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,822

Claims priority, application Japan, Oct. 21, 1983, 58-196178; Oct. 21, 1983, 58-196179; Feb. 23, 1984, 59-31505; Feb. 23, 1984, 59-31506; Mar. 23, 1984, 59-54507; Mar. 23, 1984, 59-54508

Int. Cl.[4] G01V *1/32*

U.S. Cl. 250—205 6 Claims



1. A rotary encoder comprising:

a light emitting device

a photosensor;

sampling means disposed between said light emitting device and said photosensor for intercepting light from said light emitting device as said sampling means is rotated;

monitoring means disposed on a side of said sampling means adjacent to said light emitting device for sensing a portion of the light from said light emitting device to produce a signal representing a light intensity sensed; and

means for controlling the light intensity of said light emitting device in accordance with an output from said monitoring means.

4,712,001

TRANSIENT ANALYSIS SYSTEM USING A PHOTONIC SAMPLER DEVICE

Etienne d'Humieres, Versailles; Jean M. Bernet, La Celle St. Cloud, and Claude Imhoff, St. Germain en Laye, all of France, assignors to Thomson CSF, Paris, France

Filed Dec. 12, 1985, Ser. No. 808,032

Claims priority, application France, Dec. 14, 1984, 84 19196

Int. Cl.[4] H01J *31/50*

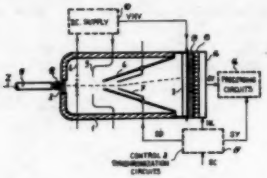
U.S. Cl. 250—213 VT 9 Claims

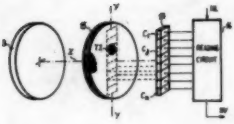
1. A transient analysis system comprising:

photonic sampler means including a tube having a vacuum enclosure and input and output ends, said input end including a photocathode for receiving light signals to be analyzed and for transforming the light signals into an electron beam, said output end including a fluorescent screen and said vacuum enclosure containing deflection electrodes provided for deflecting the electron beam received from said photocathode in a predetermined direction thereby producing a light plot of transient phenomena resulting from the deflected electron beam striking said fluorescent screen, said photonic sampler means providing light intensification of a predetermined gain by said tube being optically coupled on the input end to a single optical analysis channel allowing said photocathode to be of reduced dimensions for receiving the light plot corresponding to the optical signal to be processed; and

image detector means including a solid state detector strip optically coupled to said fluorescent screen of said photonic sampler means, said detector strip being disposed

parallel to the deflection direction and centered substantially along a diameter of said tube which corresponds to





the light plot scanning range caused by the electron beam deflection.

4,712,002

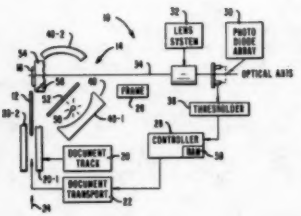
IMAGING SYSTEMS EMPLOYING APPARATUS FOR EVENLY ILLUMINATING OBJECTS TO BE SCANNED

Tuan-Kay Lim, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 9, 1986, Ser. No. 917,332

Int. Cl.[4] G03B *27/54;* H01J *3/16*

U.S. Cl. 250—216 **16 Claims**



9. A system for imaging documents comprising:

a scanning plane having a scanning line therein;

means for presenting a said document at said scanning plane;

an elliptical cylindrical mirror means for directing light evenly on said document along said scanning line;

said elliptical cylindrical mirror means having first and second focal lines and comprising:

a first elliptical cylindrical section having said first focal line adjacent thereto; and

a second elliptical cylindrical section having said second focal line adjacent thereto and also cooperating with said first elliptical cylindrical section for directing light from said first focal line to said second focal line;

said elliptical cylindrical mirror means being positioned relative to said scanning plane to enable said second focal line to be substantially coincident with said scanning line;

said second elliptical cylindrical section having a non-reflecting area facing said second focal line and being located substantially at the center of said second elliptical cylindrical section as measured along the direction of said second focal line;

first and second planar mirrors located in substantially spaced parallel relationship to each other at opposed ends of said scanning line at said scanning plane and positioned substantially perpendicular to said scanning plane;

a linear-type source of illumination positioned at said first focal line;

an optical axis which is located substantially perpendicularly to said scanning plane at said scanning line and passes between said first and second elliptical cylindrical sections;

a light detector array located on said optical axis; and

a lens system located on said optical axis for directing light reflected from said document along said scanning line to said light detector array.

4,712,003

BLIND PERSON GUIDE DEVICE

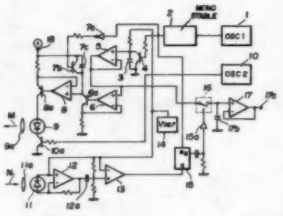
Itsuki Ban, 3-50-18 Higashi-Oizumi, and Yuji Mitsuta, 4-28-17 Shimoshakujii, both of Nerima-ku, Tokyo, Japan

Continuation of Ser. No. 632,668, Jul. 20, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,740

Claims priority, application Japan, Jul. 27, 1983, 58-115612[U]; Jun. 6, 1984, 59-82961[U]

Int. Cl.[4] G01S *17/06*

U.S. Cl. 250—221 **5 Claims**



1. A blind person guide device comprising:

a source for emitting a beam of pulse-shaped infrared radiation of a peak value that is limited in a forward direction;

a photoelectric element for receiving infrared radiation reflected from an object irradiated by said beam;

an electric circuit having means for removing an influence of a disturbance light such as sunlight or illumination light from the illuminance or received radiation on said photoelectric element by modulating said infrared radiation at an audio frequency between 100 and 1000 Hz, and means for sampling-and-holding the signal from said influence removing means, the resulting held signal corresponding to information as to a distance to the object;

an oscillator for generating electric vibrations having a frequency and an amplitude which are dependent on the distance information produced by said electric circuit; and

a power supply switch for energizing and de-energizing said electric circuit and said oscillator, said power supply switch having a pressor comprising a vibrator which is vibratable in response to said electric vibrations and against which a human skin can be pressed.

4,712,004

METHOD AND APPARATUS FOR COMPENSATING FIBER OPTIC LEAD AND CONNECTOR LOSSES IN A FIBER OPTIC SENSOR BY USING A BROADBAND OPTICAL SOURCE AND MULTIPLE WAVE RETARDATION

William B. Spillman, Jr., Charlotte, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Aug. 20, 1986, Ser. No. 898,318

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **27 Claims**

1. Optical sensor apparatus, comprising:

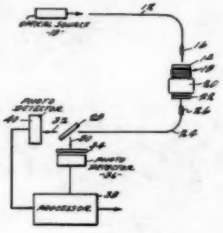
optical source means for providing a broadband source light beam including a plurality of spectral components, each spectral component having a different wavelength;

polarizer means for receiving said source light beam and polarizing it to provide a polarized light beam including said plurality of spectral components;

multiple wave retardation means for receiving said polarized light beam and retarding said plurality of components to provide a retarded light beam having a plurality of retarded components;

optical transducer means for (a) receiving said retarded light beam, (b) modulating said retarded components in accordance with an externally applied condition, each retarded component being modulated by an amount corresponding to the wavelength associated with each retarded component, and (c) providing an output light beam having a plurality of modulated components;

analyzer means for receiving said output light beam and providing an analyzed light beam having a plurality of analyzed components corresponding to said plurality of



modulated components, a total light intensity of said analyzed light beam remaining effectively unresponsive to said externally applied condition;

filter means for (a) receiving said analyzed light beam (b) providing a first optical signal having only one portion of said analyzed components, said one portion including an analyzed component which varies according to said externally applied condition, and (c) providing a second optical signal including said plurality of analyzed components;

photodetector means for (a) receiving said first and second optical signals, (b) converting said optical signals into electrical signals, (c) providing a first electrical signal corresponding to an intensity of said first optical signal, and (d) providing a second electrical signal corresponding to an intensity of said second optical signal; and

processing means for receiving said first and second electrical signals and providing an output signal corresponding to a ratio of said first and second electrical signals.

4,712,005

FLOATING MASK ENCODER WITH ASSEMBLY SPACER

Lalit J. Savla, Nesconset, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Dec. 19, 1985, Ser. No. 810,605
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE **8 Claims**

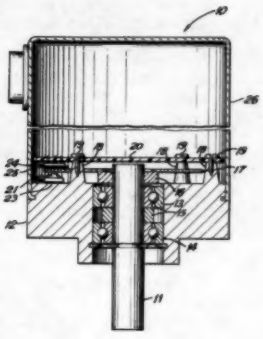
1. A method of manufacturing a shaft position encoder requiring a minimum of precision machining and exhibiting simplified alignment characteristics and which is of the type including a rotary encoded disk including position markings thereon and a stationary detector having a mask disposed thereon for reading said position markings to produce electrical signals indicative of shaft position, comprising the steps of:

mounting the encoded disk for rotation with the shaft;

mounting a circuit board near the encoded disk;

placing the detector between the encoded disk and the circuit board with the leads thereof passing through apertures in the circuit board;

aligning the detector and the encoded disk with the surface of said mask and the surface of said disk in parallel with each other and with an air gap of less than 0.005" between their surfaces using a spacer between the detector and the encoded disk surface;



mechanically securing the detector leads to the circuit board with the spacer in place; and

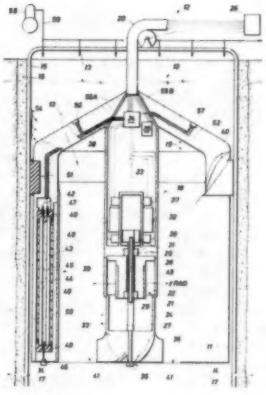
thereafter removing the spacer.

4,712,006

STEAM QUALITY MEASUREMENT APPARATUS AND METHOD

Bernard Zemel, and Philip J. Closmann, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 27, 1985, Ser. No. 770,115
Int. Cl.[4] G01V 5/08
U.S. Cl. 250—269 **10 Claims**



1. A steam quality measurement apparatus for use in monitoring the steam quality of a steam-water mixture passing down the throughbore of a steam injection well, said steam quality measurement apparatus comprising;

emitter means centrally located with respect to a central longitudinal axis, said emitter means having; electrical conduit means connected to said emitter means,

an emitter source characterized by the emission of radiation, said emitter source formed from selected radioactive material positioned about said central longitudinal axis of said emitter means, signal processing means located in the emitter means to process an output signal so as to monitor the steam quality,

radiation detection means capable of providing said ouptut signal substantially proportional to the amount of radia-

tion received from said emitter means, said radiation detection means having;

a radiation detector providing said output signal and located in a tubular manner and extending longitudinally alongside and at a spaced distance from said central longitudinal axis,

a packer formed about an outer circumference of said radiation detector, said packer carried by said detector and operatively contacted with said well throughbore so as to form a seal between said well throughbore and said detector, and

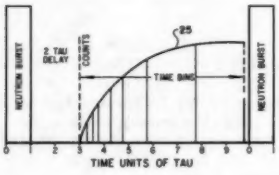
a tubular aperture defined in an annular manner between said emitter means and said radiation detection means and located at an upper and so as to direct substantially all of said steam-water mixture passing downward through said throughbore.

4,712,007

PULSED NEUTRON LOGGING METHOD USING CUMULATIVE COUNT CURVES

Michael A. Ondrik, Albuquerque, N. Mex., assignor to S.I.E., Inc., Fort Worth, Tex.

Filed Apr. 1, 1985, Ser. No. 718,521
Int. Cl.[4] G01V *5/10*
U.S. Cl. 250—270 **5 Claims**



1. A method of measuring earth formation characteristics, comprising in combination:

repetitively irradiating the earth formations with pulses of neutrons; then

detecting gamma rays emanating from the irradiated formations; and

cumulatively counting for a preselected counting period following each pulse the total gamma rays detected in a plurality of separate time bins, and adding the total count from each preceding bin to the count from a next bin, the cumulative counts for each pulse defining points on a cumulative count versus time curve which has a mathematical expression; and

computing from the cumulative counts of the time bins variables in the mathematical expression which correspond to characteristics of the earth formations.

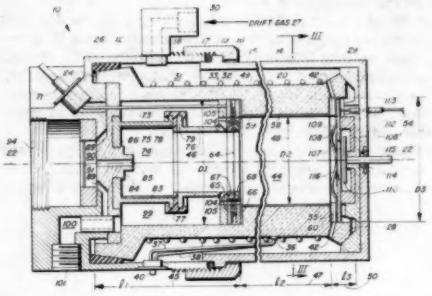
4,712,008

ION MOBILITY SPECTROMETER

Kishore N. Vora, Herndon, Va.; John P. Carrico, Sr., Baltimore, Md.; Glenn E. Spangler, Lutherville, Md.; Donald N. Campbell, and Charles E. Martin, both of Timonium, Md., assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 18, 1986, Ser. No. 908,840
Int. Cl.[4] H01J *49/40*
U.S. Cl. 250—287 **8 Claims**

1. An ion mobility spectrometer comprising a cylindrical tube containing a reaction region, a shutter assembly, a drift region, an aperture grid, and collector; a housing including means for inserting said cylindrical tube therein and having a space between said side walls of said housing and the outside surface of said cylindrical tube, an inlet in said housing for introducing drift gas into said space, a heating element in said space for heating said cylindrical tube and said drift gas and means for introducing said drift gas from said space into said drift region, said cylindrical tube having a first length having at least a first inside diameter and a second length having a second inside diameter less than said first inside diameter forming a first interior annular ledge between said first and second lengths, said ledge having a first conductive layer thereon, the inside surface of said second length having a resistive layer



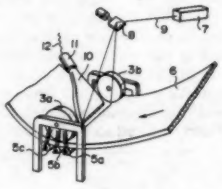
thereon and in electrical contact with said first conductive layer, a shutter assembly positioned against said first interior annular ledge having electrical contacts at its periphery in contact with said first conductive layer on said first interior annular ledge.

4,712,009

APPARATUS FOR SCANNING SHEET-SHAPED RECORDING MEDIUM

Makoto Ohgoda, and Kaoru Tamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 20, 1984, Ser. No. 673,443
Claims priority, application Japan, Nov. 21, 1983, 58-219312
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **2 Claims**



1. An apparatus for scanning a sheet-shaped stimulable phosphor recording medium, the apparatus comprising:

(i) a conveyance means comprising a conveying roller and a plurality of nip rollers for forming nips for conveying said sheet-shaped stimulable phosphar recording medium in co-operation with said conveying roller by contacting the surface of said conveying roller, and

(ii) a scanning optical system for scanning said sheet-shaped stimulable phosphor recording medium, which is conveyed by said conveyance means, by a light beam in a scanning direction approximately normal to the conveyance direction of said sheet-shaped stimulable phosphor recording medium,

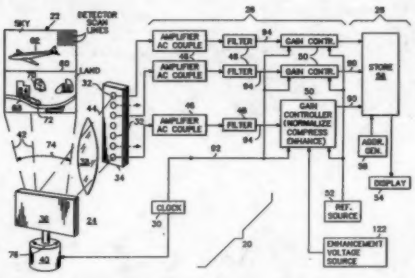
(iii) one of said conveying roller and said nip rollers being fabricated as edge rollers contacting the other of said conveying roller and said nip rollers only near both end portions of the other,

(iv) said scanning optical system being positioned on the side of said edge rollers for scanning between said edge rollers.

4,712,010
RADIATOR SCANNING WITH IMAGE ENHANCEMENT AND NOISE REDUCTION

Ake W. Alm, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 30, 1986, Ser. No. 824,350
Int. Cl.[4] H04N 5/33
U.S. Cl. 250—334 21 Claims



1. An imaging system comprising:

an array of radiation detectors arranged along the vertical dimension of a scanning pattern;

means for directing radiation from a subject, distant from said system, toward said array of detectors to permit a viewing of said subject by said system, said directing means including means for scanning said radiation along a set of scan lines sweeping out adjacent regions of the subject with a scan interval of predetermined duration to provide a two-dimensional raster scan of a scene including said subject, each of said detectors providing a signal in response to radiation incident upon the detector;

means for displaying data to be carried by signals of respective ones of said detectors to present an image of the scene containing said subject;

signal processing means interconnecting said displaying means with said array of detectors, said signal processing means including gain normalizing means for amplifying individual ones of said detector signals with a gain varying inversely to average signal strength;

wherein said normalizing means is configured as a feedback loop and includes nonlinear means for introducing a nonlinear gain characteristic, said normalizing means including enhancement means for clarifying edge lines of said subject, said nonlinear means coacting with said enhancement means to provide an adaptive enhancement characteristic dependent on the strength of signals from the corresponding detectors; and

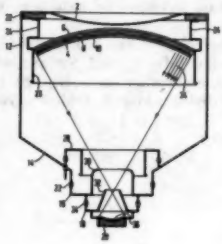
wherein said normalizing means includes noise reduction means coupled to said enhancement means for reducing the gain of said gain characteristic for near-zero incremental values of a detector signal.

4,712,011
X-RAY IMAGE INTENSIFIER TUBE INCLUDING A LUMINESCENT LAYER WHICH ABSORBS SECONDARY RADIATION

Johannes A. J. Van Leunen, Heerlen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1986, Ser. No. 847,808
Claims priority, application Netherlands, Apr. 3, 1985, 8500981
Int. Cl.[4] G01T 1/20
U.S. Cl. 250—361 R 20 Claims

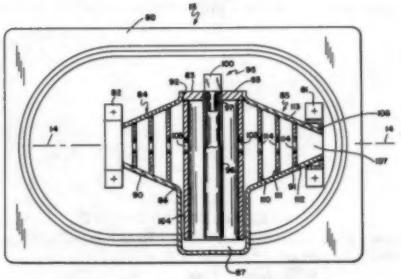
1. An X-ray image intensifier tube which includes an entrance screen with a layer of luminescent material provided on a substrate as well as a photocathode, and also includes an electron-optical system for imaging photoelectrons, to be emitted by the photocathode, on an exit screen of the tube, characterized in that the layer of luminescent material includes an absorption material which contains an element having a comparatively high absorption for characteristic X-rays emitted by the luminescent material the absorption material amounting to from approximately 1 to 5 percent by weight of the layer of luminescent material.



4,712,012
CHARGE CONVERSION UNIT FOR NEGATIVE ION SOURCE

Harry Naylor, Richmond, New Zealand, assignor to General Ionex Corporation, Newburyport, Mass.

Filed Jul. 26, 1985, Ser. No. 759,464
Int. Cl.[4] H01J 27/00
U.S. Cl. 250—423 R 4 Claims



1. A charge conversion apparatus for converting positive ions to negative ions by passing the positive ions through a converting material in the vapor state, said apparatus including:

A. a supporting structure,

B. a housing with a central portion having barriers thereby to form a substantially isothermal volume and apertures in the wall thereof through which the ion beam passes,

C. a reservoir at the bottom of said central portion for accumulating the converting material in the liquid state,

D. heater means located in the central portion for continuously vaporizing the converting material in the reservoir,

E. thermally conductive conical sections extending from said central region thereby to produce a thermal gradient to a supporting structure, and;

F. a plurality of transverse baffles within said conical sections, each having an aperture aligned on the beam axis for condensing the vapor, the liquid returning to the reservoir through gravity.

4,712,013

METHOD OF FORMING A FINE PATTERN WITH A CHARGED PARTICLE BEAM

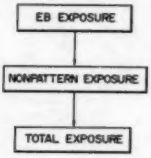
Eiji Nishimura; Tadahiro Takigawa, and Yoshihide Kato, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 778,795, Sep. 23, 1985, abandoned. This application May 4, 1987, Ser. No. 45,160

Claims priority, application Japan, Sep. 29, 1984, 59-204426; Sep. 29, 1984, 59-204437; Mar. 5, 1985, 60-43448

Int. Cl.[4] H01J *37/00*

U.S. Cl. 250—492.2 17 Claims



1. A method of forming a fine pattern with a charged beam, comprising the steps of:

performing a first irradiation of a predetermined region of a sample with a charged beam to form an exposed pattern on the sample; and

performing a second irradiation of a region around the pattern with either of a charged beam or an electromagnetic wave, and at a dose smaller than the dose for forming the exposure pattern, to perform an auxiliary exposure, the auxiliary exposure being such that a molecular amount distribution remains substantially unchanged along the direction of thickness of said region around the pattern of the sample wherein the step of performing the auxiliary exposure occurs at a voltage of not less than 30 keV.

4,712,014

RADIATION LAMP UNIT

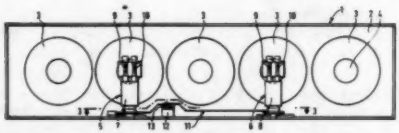
Helmut Eich, Uhlandstrasse 7, 7417 Reutlingen-Pfullingen, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 871,347

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1985, 3520659

Int. Cl.[4] G21G *4/00*; A61N *00/00*

U.S. Cl. 250—494.1 7 Claims



1. A radiation lamp unit, comprising: an elongate housing (1), a plurality of highly-polished concave reflectors (3) mounted in the housing, an equal plurality of light-orange radiation lamps (4) individually disposed at focal point areas of the reflectors, and two UV lamp units (9, 10) secured to mounting bases (7, 8) spaced apart from each other and symmetrically disposed about a center axis of the housing.

4,712,015

SHIELDS FOR NUCLEAR REACTORS

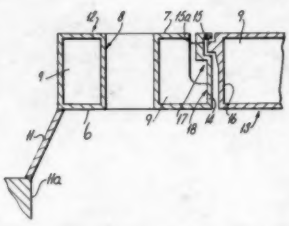
Garth J. Aspden, Bolton, England, assignor to National Nuclear Corporation Limited, Knutsford, England

Filed Nov. 19, 1985, Ser. No. 799,579

Claims priority, application United Kingdom, Dec. 17, 1984, 8431754

Int. Cl.[4] G21C *13/06, 9/00*

U.S. Cl. 250—517.1 6 Claims



1. A roof shield for a nuclear reactor comprising a normally fixed radially outer portion having a radially inner wall, a radially inner portion rotatable about a vertical axis, and a connection between the inner and outer portions which permits relative angular movement between the portions without loss of containment, the connection being on the radially inner side of an upper portion of the radially inner wall of the outer portion, the upper portion of the inner wall being connected to the outer portion only at the lower end of the upper portion and the upper portion being so arranged that on upward movement of the inner portion the upper portion of the inner wall receives substantially no angular movement, the lower end of the upper portion being at a position below the connection and below the level of the upper surface of the outer portion.

4,712,016

ALIGNMENT SYSTEM ALLOWING ALIGNMENT WHEN ALIGNMENT MARKS ARE ABSENT

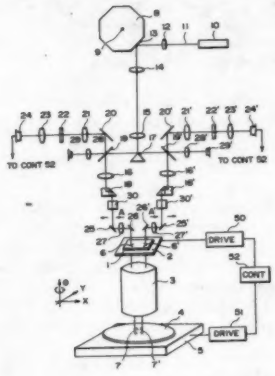
Takashi Matsumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,736

Claims priority, application Japan, Jan. 30, 1985, 60-014485

Int. Cl.[4] G01B *11/00*

U.S. Cl. 250—548 7 Claims



1. An alignment system for sequentially aligning individual portions of a first object with respect to a second object by use of alignment marks provided for the respective portions of the first object, said system comprising:

driving means for moving stepwise the first object relative to the second object;

means for detecting an alignment mark provided for such one of the portions of the first object that is positioned by the stepwise movement by said driving means so as to be correlated with the second object;

aligning means for adjusting the relative position of the first and second objects on the basis of the detection by said detecting means so that the aforesaid one portion of the first object is placed in alignment with the second object, said aligning means adjusting the relative position of the first and second objects to align the aforesaid one portion of the first object with the second object on the basis of the detection, by said detecting means, of an alignment mark provided for another portion of the first object in the neighborhood of the aforesaid one portion, when the alignment mark provided for the aforesaid one portion is not detected by said detecting means.

4,712,017

PHOTOCOUPLER DEVICE HAVING REFLECTING SURFACE ENHANCE SIGNAL TRANSMISSION

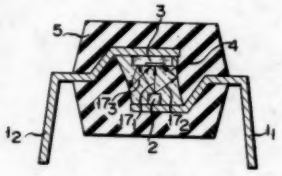
Keiji Kamasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 27, 1985, Ser. No. 749,382

Claims priority, application Japan, Oct. 16, 1984, 59-217103

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 250—551 **7 Claims**



1. A photocoupler device, comprising:

a light-emitting element for emitting light;

a semiconductor light-receiving element having a light-receiving planar surface region for receiving light emitted from said light-emitting element, said light-receiving planar surface region having an effective portion and an ineffective portion, said effective portion converting light impinging thereon into an electricla signal; and

a light-reflecting layer formed on said ineffective portion of said light-receiving planar surface region for reflecting at least a portion of said light emitted from said light-emitting element onto said effective portion of said light-receiving planar surface region, thereby making an effective use of said reflected light to generate said electric signal.

4,712,018

METHOD AND APPARATUS FOR FABRICATING FULL WIDTH SCANNING ARRAYS

James C. Stoffel, Rochester, and Jagdish C. Tandon, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

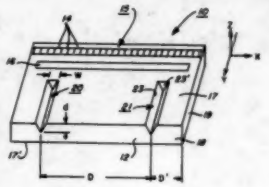
Division of Ser. No. 462,593, Jan. 31, 1983, Pat. No. 4,690,391. This application Mar. 26, 1987, Ser. No. 30,308

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—578 **3 Claims**

1. A short linear scanning array adapted to be assembled with like ones of said short arrays in end to end abutting relationship to provide a longer linear scanning array, said short array including a base and at least one row of image processing elements, the improvement comprising:

at least two array aligning formations on said short array base, said array aligning formations being disposed at preset locations on said short array base, said array aligning formations being adapted to associate with stationary



array aligning formations disposed in predetermined array aligning locations to permit assembly of said short array with others of said short arrays to provide said longer array.

4,712,019

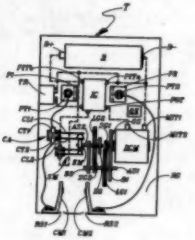
PROGRAMMABLE ELECTRONIC PLUG-IN TIMER

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Apr. 10, 1985, Ser. No. 721,670

Int. Cl.⁴ H01H *43/00*

U.S. Cl. 307—141 **20 Claims**



1. A combination comprising:

contactor means having a pair of electrical terminals and being operable to exist in either of two states: (i) a state wherein electric current is permitted to flow freely between said terminals, and (ii) a state wherein electric current is prevented from flowing freely between said terminals; said contactor means being operable at any given time, on receipt of a mechanical actuation input, to change from one of said states to the other of said states, regardless of the nature of the particular state in which it exists at said given time;

actuator means operable each time on receipt of a discrete electrical actuation input to provide said mechanical actuation input;

electric energy means operative to supply electric power without having to be connected with an electric utility power line;

clock means connected with said electric energy means and operable to provide an accurate clock signal;

programming means connected with said electric energy means and with said clock means, and operative to provide said discrete electrical actuation input repeatedly in accordance with a presetable program referenced to time-of-day; and

structure means operative to support and hold together in substantially rigid relationship said contactor means, said clock means, and said programming means;

whereby said contactor means is at certain selected times caused to permit current to flow freely between said terminals, and at certain other times caused to prevent such flow of current.

4,712,020

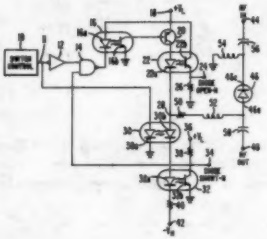
BIAS CONTROL CIRCUIT FOR RF SWITCH

Philip C. Basile, Turnersville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 20, 1986, Ser. No. 876,984

Int. Cl.[4] H03K *17/74, 19/14*

U.S. Cl. 307—256 **19 Claims**



1. An apparatus for controlling a switching diode by the selective application of forward bias current and reverse bias voltage thereto, said reverse bias voltage being of such a magnitude as to cause a reverse leakage current through said diode which has a magnitude less than a predetermined magnitude when said diode is in a normal operating condition, and to cause a reverse leakage current through said diode which has a magnitude substantially greater than said predetermined magnitude when said diode is in a shorted condition said apparatus comprising:

a first bias circuit for coupling forward current to said diode;

a second bias circuit for applying reverse voltage to said diode, said reverse voltage producing said reverse leakage current flow through said diode, said second bias circuit including means responsive to said reverse leakage current flow through said second bias circuit which has a magnitude substantially greater than said predetermined magnitude for latching said reverse leakage current therethrough;

first generating means responsive to said reverse leakage current flow through said second bias circuit for generating a diode alarm signal; and

means for selectively enabling said first and second bias circuits, said diode alarm signal being coupled to said enabling means for disabling said first bias circuit.

4,712,021

CMOS INVERTER

Wolfgang Gollinger, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,353

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 85108065[U]

Int. Cl.[4] H03K *5/24, 19/017, 19/094*

U.S. Cl. 307—355 **12 Claims**

1. An inverter comprising:

an inverter input terminal;

an inverter output terminal;

a first current mirror having an output transistor taking the form of an n-channel CMOS second transistor having a gate and a controlled current path, said first current mirror having a drive input;

a second current mirror having an output transistor taking the form of a p-channel CMOS first transistor having a gate and a controlled current path, said second current mirror having a drive input;

means for connecting to a voltage source, said controller current paths of said first and second transistors being connected in series between positive and negative terminals of said means for connecting to a voltage source and having a junction therebetween;

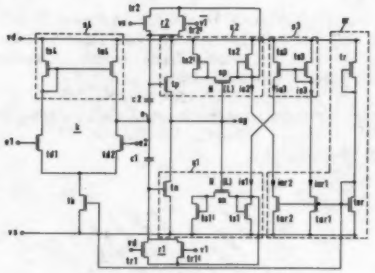
said inverter output terminal being connected to said junction between the controlled current paths of said first and second transistors to provide an output signal of said inverter;

a first capacitor connecting said input terminal to the gate of said first transistor;

a second capacitor connecting said input terminal to the gate of said second transistor;

a third current mirror having a drive input and a first current output, said first current output of said third current mirror being connected for providing drive current to said first current mirror drive input;

a reference current mirror having a second current output, said second current output of said reference current mirror being connected for providing drive current to said third current mirror, and having a third current output



connected for providing drive current to said second current mirror;

first resistor means coupling the gate of said n-channel CMOS second transistor to said first current mirror drive input; and

second resistor means coupling the gate of said p-channel CMOS first transistor to said second current mirror drive input;

wherein output currents of said first and second current mirrors are switched between a high and low current value depending on output levels of said inverter such that said first current mirror has a low output current value when said output level is a first level and has a high output current value when said output level is a second level, while said second current mirror has a high output current value when said output level is said first level and has a low output current value when said output level is said second level.

4,712,022

MULTIPLE INPUT OR-AND CIRCUIT FOR FET LOGIC

Tho T. Vu, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 28, 1985, Ser. No. 750,107

Int. Cl.[4] H03K *19/094, 17/16, 5/08, 3/26*

U.S. Cl. 307—448 **19 Claims**

1. A logic circuit for applying a logic signal to the control gate of a switching FET, said circuit including a reference node, comprising:

a first logic node;

a first FET having a drain region, a source region and a control gate, wherein the drain region of said first FET is connected to said reference node, said first logic node is connected to the source region of said first FET, and data is input to the control gate of said first FET;

first load means connected to said first FET;

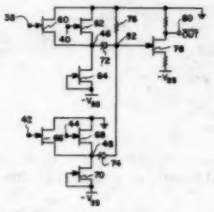
a first diode having an anode and a cathode, wherein the

cathode of said first diode is connected to said first logic node;

a second logic node;

a second FET having a drain region, a source region and a control gate, wherein the drain region of said second FET is connected to said reference node, said second logic node is connected to the source region of said second FET, and data is input to the control gate of said second FET;

second load means connected to said second FET;



a second diode having an anode and a cathode, wherein the cathode of said second diode is connected to said second logic node;

third load means; and

a third logic node, wherein the anodes of said first and second diodes are each connected to said third logic node, wherein said third load means is connected to and between said reference node and said third logic node and wherein said third logic node is connected to said control gate of said switching FET.

4,712,023

BUFFERED FET LOGIC GATE USING DEPLETION-MODE MESFET'S.

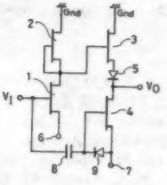
Tatsuo Otsuki, Takatsuki; Akio Shimano, Osaka; Hiromitsu Aoki, and Ikuko Aoki, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 13, 1986, Ser. No. 929,844

Claims priority, application Japan, Nov. 13, 1985, 60-254124

Int. Cl.[4] H03K *19/017, 19/094*

U.S. Cl. 307—450 **18 Claims**



1. A gate circuit comprising:

a first power source terminal to be supplied with a first potential,

a second power source terminal to be supplied with a second potential,

a third power source terminal to be supplied with a third potential,

a first FET connected by its gate to an input terminal and by its source to said first power source terminal,

a second FET connected by its gate and source to the drain of said first FET and by its drain to said third power source terminal,

a third FET connected by its gate to the drain of said first FET and the source and the gate of said second FET and by its drain to said third power source terminal,

a first diode connected by its one electrode to the source of said third FET,

a fourth FET connected by its drain to the other electrode of said first diode and by its source to the second power source terminal,

an output terminal connected to junction point between said other electrode of said first diode and the drain of said fourth FET,

a second diode connected by its one electrode to the source of said fourth FET and by its other electrode to the gate of said fourth FET, and

a capacitive element connected across a junction

a capacitive element connected across a junction point between the gate of said fourth FET and said other electrode of said second diode and the gate of said first FET.

4,712,024

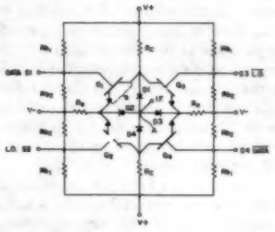
ACTIVE BALUM STAR MIXER

Charles F. McGuire, Kaysville; David J. Weber, Sandy, and Gordon C. Steyaert, Salt Lake City, all of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 16, 1985, Ser. No. 766,187

Int. Cl.[4] G06G *7/00;* **H03K** *9/06*

U.S. Cl. 307—529 **13 Claims**



1. A mixer circuit comprising,

first and second diodes having a respective cathode thereof connected together,

third and fourth diodes having a respective anode thereof connected together and to the cathodes of said first and second diodes at a common junction to provide an output terminal,

first source means connected to each respective anode of said first and second diodes,

second source means connected to each respective cathode of said third and fourth diodes,

first transistor means having its emitter-collector conduction path connected between the anode of said first diode and the cathode of said fourth diode,

second transistor means having its emitter-collector conduction path connected between the anode of said first diode and the cathode of said third diode,

third transistor means having its emitter-collector conduction path connected between the anode of said second diode and the cathode of said fourth diode,

fourth transistor means having its emitter-collector conduction path connected between the anode of said second diode and the cathode of said third diode,

first input means supplying switching signals to the control electrode of each of said second and third transistor means, and

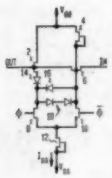
second input means supplying oscillator signals to the control electrode of each of said first and fourth transistor means.

4,712,025

ANALOG SWITCH

Frederick G. Weiss, Portland, Oreg., assignor to Triquint Semiconductor, Inc., Beaverton, Oreg.

Filed Apr. 26, 1985, Ser. No. 727,483
Int. Cl.[4] H03K 17/16, 17/687
U.S. Cl. 307—571 12 Claims



1. A switch circuit comprising:

a switch element having first and second controlled current terminals, and switch control terminal connected to a first node of the switch circuit and further connected through a resistive load element to a first reference potential source, for receiving control current from said first reference potential source, said switch element having a conductive state, in which current flows between the first controlled current terminal and the second controlled current terminal, and a non-conductive state, in which current flow between the first controlled current terminal and the second controlled current terminal is prevented, said switch element being placed in its conductive state when the potential at the switch control terminal bears a predetermined relation to the potential at at least one oif said first and second controlled current terminals, and being placed in its non-conductive state when the potential at the switch control terminal does not bear said predetermined relation to the potential at said at least one controlled current terminal,

a follower device having a first follower terminal connected to said first reference potential source, a second follower terminal connected to the first controlled current terminal of the switch element and also having a third follower terminal, said follower device having the property that the potentials at its second and third follower terminals remain in substantially fixed relation when current is conducted through the device from the first follower terminal to the third follower terminal,

a first unidirectionally-conductive element connected between the first node of the switch circuit and a second node of the switch circuit for conducting current into said second node of the switch circuit from the switch control terminal of the switch element,

a second unidirectionally-conductive element connected between the third follower terminal and the second node of the switch circuit for conducting current into said second node of the switch circuit from said third follower terminal,

at least one additional unidirectionally-conductive element connected anti-parallel to said first unidirectionally-conductive element between said first and second nodes of the switch circuit,

a constant current source connected to a control current terminal, for delivering current to a second reference potential source, and

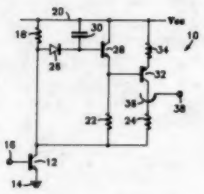
current-steering means for connecting the constant current source selectively to the first node of the switch circuit, whereby the switch element is placed in its non-conductive state, or to the second node of the switch circuit, whereby the switch element is placed in its conductive state and the potential at the switch control terminal of the switch element is maintained in a fixed relation to that at the first controlled current terminal of the switch element by the action of the follower device.

4,712,026

DELAY CIRCUIT

John M. Pigott, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1986, Ser. No. 926,498
Int. Cl.[4] H03K 5/13
U.S. Cl. 307—600 5 Claims



1. An integrated circuit responsive to an input signal for providing an output signal a predetermined time interval thereafter, comprising:

first and second power supply conductors to which an operating potential and a ground reference potential are respectively supplied;

a charge storage device coupled between said first power supply conductor and a first circuit node;

discharge circuit means connected between said first circuit node and said first power supply conductor for providing a discharge current path for said charge storage device when enabled;

charge circuit means coupled between said first power supply conductor and a second circuit node and having an input coupled to said first circuit node for providing a current path for charging said charge storage device when enabled;

a first transistor having a base coupled to an input of the circuit, an emitter coupled to said second power supply conductor and a collector coupled both to said discharge circuit means and said second circuit node, said first transistor being responsive to the input signal for disabling said discharge circuit means while enabling said charge circuit means, said discharge circuit means being enabled when said first transistor is rendered nonconductive; and

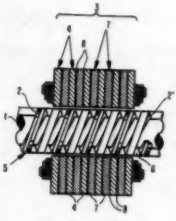
comparator means having an input coupled to said charge circuit means and being responsive to said charge storage device being charged to a predetermined level for providing the output signal at an output a predetermined time interval after the input signal is applied to the delay circuit.

4,712,027

RADIAL POLE LINEAR RELUCTANCE MOTOR

John P. Karidis, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,527
Int. Cl.[4] H02K 41/00
U.S. Cl. 310—12 12 Claims



1. A linear variable reluctance motor having relatively mov-

able aramture and stator members, and electromagnetic windings on at least one of said members forming an electromagnetically active envelope of said first and second members, characterized in that:

a first one of said members comprises a stack of laminar pairs of alternate radial pole ferromagnetic laminar plates and nonferromagnetic laminar spacers, with a smooth internal channel having an inside diameter complementary to the outside diameter of said first member to allow a sliding relationship within the electromagnetically active envelope of said first and second members, each laminar pair of laminar pole plate and laminar spacer together with related cement being dimensioned in total thickness substantially equal to one tooth interval, said laminar pole plate and laminar spacer being separated by at least one insulating layer to minimize eddy currents, the total aggregate thickness of said laminar pairs and spacing cement being equal to nominal stack length,

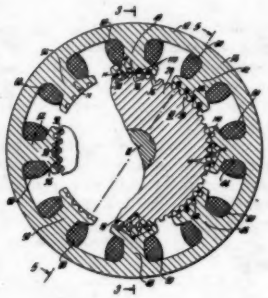
whereby the teeth are positioned with their average linear tooth interval equal to the nominal tooth spacng.

4,712,028

MAGNETICALLY ASSISTED STEPPING MOTOR

Ralph W. Horber, Marshfield, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed May 21, 1984, Ser. No. 612,563
Int. Cl.[4] H02K *37/00*
U.S. Cl. 310—49 R **16 Claims**



1. A stepping motor, comprising:

a stator

a plurality of poles on said stator,

a plurality of spaced stator teeth on each of said poles;

winding means for energizing each of said poles so as to magnetize the plurality of teeth on any one of said poles in the same direction at any one time;

a rotor movable relative to said stator;

said rotor having a plurality of spaced rotor teeth located for movement along a first direction past said stator pole teeth;

said rotor teeth and said stator teeth forming spaces having widths along a path of relative rotor-stator movement and depths transverse to the path of movement;

a plurality of permanently magnetized structures located adjacent to the plurality of rotor teeth or the plurality of stator teeth and poled in the direction of the depth of the spaces;

said structures being located in spaces adjacent the stator teeth;

said rotor teeth being skewed relative to the transverse direction of the path of movement by a fraction of a tooth pitch;

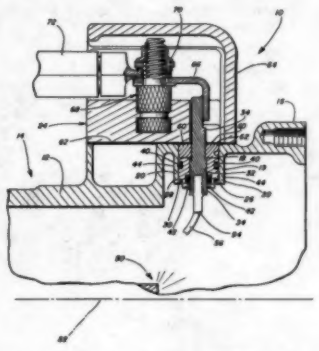
said permanently magnetized insert including a neodymium-boron alloy.

4,712,029

GENERATOR HIGH TEMPERATURE ELECTRICAL LEAD ASSEMBLY

Robert D. Nold, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1986, Ser. No. 945,033
Int. Cl.[4] H02K *5/10, 9/00;* **H01B** *17/30*
U.S. Cl. 310—71 **11 Claims**



1. A terminal assembly for connecting a stator signal to the exterior of the housing of a gas-filled, oil-cooled generator, comprising:

a terminal insulator extending through an opening in the generator housing, said insulator having an opening therethrough and said housing opening further extending through a boss projecting into the housing;

means for supplying coolant around said boss;

a first O-ring providing a seal between the insulator and the boss;

a conductor extending through the terminal insulator opening and being connected to the generator stator; and

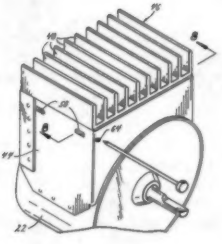
a second O-ring providing a seal between the conductor and the insulator within the portion of the opening located within said boss.

4,712,030

HEAT SINK AND MOUNTING ARRANGEMENT THEREFOR

Bryan L. Lakin, and William P. Wharton McDaniel, both of Springfield, Mo., assignors to Fasco Industires, Inc., Boca Raton, Fla.

Division of Ser. No. 805,965, Dec. 6, 1985. This application Nov. 14, 1986, Ser. No. 930,393
Int. Cl.[4] F01P *1/06;* **H02K** *9/00*
U.S. Cl. 310—89 **11 Claims**



1. In a dynamoelectric machine having a conduit box and an associated electronic circuit mounted on a PC board, the improvement comprising means to mount said PC board to the conduit box, said mounting means comprising means defining a

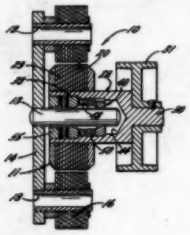
channel along at least one edge of the PC board, and means defining at least one tab in the conduit box so that said PC board may be releasably mounted therein by deforming the tab into the channel.

4,712,031

UNIT BEARING MOTOR WITH HYDRODYNAMIC LUBRICATING SYSTEM

Linda K. Anderson, Roscoe, Ill., assignor to Ancor Industries, Inc., Rockford, Ill.

Filed Nov. 12, 1986, Ser. No. 930,685
Int. Cl.[4] H02K *5/16;* **F16C** *3/14, 33/10*
U.S. Cl. 310—90 **15 Claims**



1. An electric motor having a stator assembly with a stationary cylindrical shaft extending outwardly therefrom, a rotor having a centrally located tubular housing telescoped over said shaft, first and second axially spaced sleeve bearings of porous material fixed tightly within said housing and rotatable on said shaft, each of said bearings having inner and outer walls and having inboard and outboard faces, said housing and the outboard face of said first bearing coacting to define an oil reservoir, a tubular liner of absorbent material telescoped into said housing and over said shaft and sandwiched between the inboard faces of said bearings, there being substantial radial clearance between said liner and said shaft whereby the space between said liner and said shaft defines an annular oil chamber, said reservoir and said chamber communicating with one another and being completely filled with oil, means adjacent the outboard face of said second bearing for substantially sealing said chamber outboard of said second bearing whereby said reservoir and said chamber define a substantially sealed system, the inner wall of each bearing including a cylindrical portion of predetermined diameter and length telescoped over said shaft with a close but rotatable fit, the cylindrical portion of the inner wall of each bearing terminating short of the inboard face of the bearing, and the inner wall of each bearing having a substantially circumferentially continuous enlarged diameter portion of circular cross-section extending from said cylindrical portion to the inboard face of such bearing whereby centrifugal force created by rotation of said housing an said bearings causes oil to circulate within said reservoir and said chamber and whereby said enlarged diameter portions of said bearings promote the flow of oil between said shaft and said cylindrical portions of the inner walls of said bearings.

4,712,032

LIQUID METAL CIRCULATION IN AN ACYCLIC GENERATOR COLLECTOR

Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1986, Ser. No. 939,500
Int. Cl.[4] H02K *31/00*
U.S. Cl. 310—178 **12 Claims**

1. An acyclic generator comprising, in combination:

A. a stator:

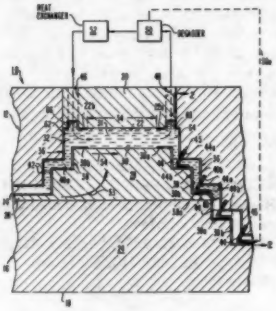
B. a rotor mounted for rotation about an axis relative to said stator;

C. an annular rotor collector surface formed on a circumferential surface of said rotor;

D. an annular stator collector surface formed in a circumferential surface of said stator in closely spaced relation with said rotor collector surface to define therebetween an annular collector gap;

E. a first stepped surface formation formed in said stator circumferential surface axially to at least one side of said stator collector surface;

F. a second stepped surface formation formed in said rotor circumferential surface axially to said one side of said stator collector surface, said first and second stepped surface formations being in conforming, closely spaced



relation to define therebetween a containment gap in fluid communication with said collector gap;

G. insulative coatings covering said first and second stepped surface formations;

H. liquid metal filling said collector gap and at least a portion of said containment gap; and

I. at least one annular fluid flow impedance member immersed in said liquid metal and spanning said containment gap to retard the communication of pressure fluxuations generated in said liquid metal in said collector gap resulting from variations in current transiting said collector gap to said liquid metal beyond said impedance member from said collector gap.

4,712,033

ACYCLIC GENERATOR WITH LIQUID METAL CURRENT COLLECTORS HAVING CIRCULATING CURRENT BARRIERS

Manoj R. Shah, Latham, and Henry G. Lenz, Scotia, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 22, 1986, Ser. No. 945,153
Int. Cl.[4] H02K *31/00*
U.S. Cl. 310—178 **11 Claims**

1. An acyclic dynamoelectric machine comprising, in combination:

A. a stator having a bore;

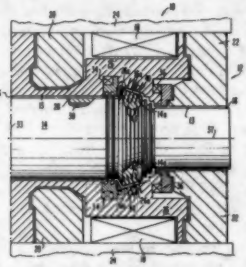
B. a rotor mounted for rotation about its axis within said bore and separated from said stator by an annular air gap;

C. a set of field windings for developing and excitation magnetic field;

D. a collector region including opposed, conforming annular collector surfaces of said rotor and said stator separated by a segment of said air gap, and liquid metal disposed within said air gap segment to conduct main current between said stator and said rotor collector surfaces; and

E. a plurality of insulative current barriers incorporated in said collector region to interrupt the continuity of at least one of said collector surfaces at the interface thereof with said liquid metal, whereby to separate said main current into multiple parallel paths at said interface and to increase

the resistance to circulating current in said collector region by forcing the circulating current in circumventing



said insulative current barriers to flow in a serpentine path into and out of said liquid metal.

4,712,034

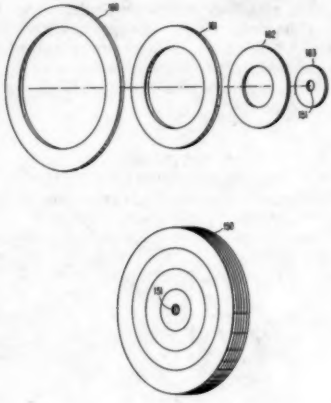
MULTIPLE RING ARMATURE CORE FOR DIRECT CURRENT MOTOR

Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 595,483, Mar. 30, 1984, Pat. No. 4,553,058. This application Nov. 12, 1985, Ser. No. 797,036

Int. Cl.⁴ H02K *15/02*

U.S. Cl. 310—217 **23 Claims**



1. An armature core for a direct current motor, said core comprising:

a plurality of laminated sheets, each sheet being formed of at least two coplanar and concentrically interfitting component parts with a space therebetween, said component parts being made of magnetic material and being washer shaped in construction, said space being filled with a first insulating material.

4,712,035

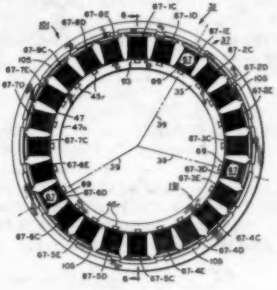
SALIENT POLE CORE AND SALIENT POLE ELECTRONICALLY COMMUTATED MOTOR

Franklin L. Forbes, and Harold B. Harms, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Nov. 12, 1985, Ser. No. 796,779

Int. Cl.⁴ H02K *15/02*

U.S. Cl. 310—269 **40 Claims**



10. A salient pole core for a dynamoelectric machine comprising:

an edgewise wound yoke including an edgewise and helically wound strip of generally thin ferromagnetic material arranged generally in aligned relation in a generally annular stack and having at least one edge defining an outer circumferential surface on said edgewise wound yoke and extending generally axially thereacross; and

a set of salient pole pieces secured in displacement preventing engagement to said edgewise wound yoke at least generally adjacent its outer circumferential surface so as to retain said wound strip against displacement from said annular stack and extending generally outwardly from said outer circumferential surface about a set of preselected pitch axes, respectively.

4,712,036

PRESSURE TRANSDUCER HAVING A PIEZOELECTRIC ELEMENT FOR PRESSURE MEASUREMENTS AT HIGH TEMPERATURES PARTICULARLY FOR THE COMBUSTION CHAMBER PRESSURE OF INTERNAL COMBUSTION ENGINES

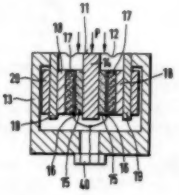
Gunter L. Gürich, Aachen, Fed. Rep. of Germany, assignor to FEV Forschungsgesselschaft für Energie-Technik und Verbrennungsmotoren mbH, Aachen, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,402

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545682

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—333 **8 Claims**



1. A pressure transducer for pressure measurement at high temperature, particularly for the combustion chamber pressure of an internal combustion engine, comprising a housing, at least

two piezoelectric flat plates loaded in shear mode and arranged laterally on opposite sides of a central stamp element, pressure distribution elements bearing externally on the piezoelectric plates, abutment elements bearing externally on said pressure distribution elements, and a prestress spring element surrounding said abutment elements and applying compressive forces to said pressure distribution elements and for retaining said plates in place, said abutment elements being connected to said housing, whereby the axial force exerted against the stamp elements by pressure to be measured exerts a thrust on both said piezoelectric plates which thrust is absorbed by said abutment elements and transferred to said housing without affecting said prestress element.

4,712,037

RESONANT PIEZOELECTRIC SENSOR

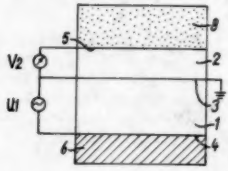
Pieter W. Verbeek, Nootdorp; Theodorus A. Klaase, Voorburg, and Arne Theil, Delft, all of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Jun. 26, 1986, Ser. No. 879,213

Claims priority, application Netherlands, Jul. 3, 1985, 8501908

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **14 Claims**



1. Sensor comprising a transmitting layer and a receiving layer located thereon of piezoelectric material, which are provided with electrodes for supplying and deriving electrical signals to said transmitting layer or from said receiving layer respectively, wherein in order to obtain a standing wave in a unit of transmitting and receiving layer, a sum of the thicknesses of said transmitting and receiving layers is selected such that with a high acoustic impedance of a boundary medium adjacent to said transmitting layer and a low acoustic impedance of a boundary medium adjacent to said receiving layer or vice versa, said sum is an odd number of v/4f, and with similar impedances, either low or high, of the said boundary media said sum is an even number of v/4f, where v is a propagation velocity of acoustic vibration in a material of said transmitting and receiving layers and f is a frequency of a signal supplied and wherein said receiving layer detects a change of a resonance mode or resonance frequency of said sensor as a unit, said change being produced by a change of environmental conditions of said sensor and on its turn producing a change of sensed amplitude.

4,712,038

COLOR CATHODE RAY TUBE WITH PLURAL ELECTRON GUN ASSEMBLIES

Shigeo Takenaka; Eiji Kamohara, and Takashi Nishimura, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 12, 1986, Ser. No. 861,842

Claims priority, application Japan, May 10, 1985, 60-97902

Int. Cl.[4] H01J *29/07, 29/50, 29/82, 29/86*

U.S. Cl. 313—2.1 **7 Claims**

1. A color cathode ray tube comprising:

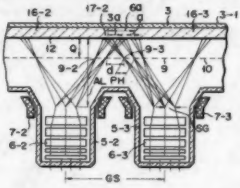
a vacuum envelope including a single faceplate, a panel having a skirt extending from said faceplate, a plurality of funnels coupled to said panel, and a plurality of necks respectively extending from said plurality of funnels;

a plurality of electron gun assemblies respectively accommodated in said plurality of necks and having central axes, said plurality of electron gun assemblies each being adapted to emit a plurality of electron beams;

a plurality of deflection units, respectively mounted around said plurality of funnels, each of said deflection units deflecting the electron beams emitted from said corresponding electron gun assembly in a deflection plane defined by each of said deflection units;

a shadow mask received in said envelope and faced to said faceplate and having apertures of predetermined pitch Ph for allowing passage of deflected electron beams therethrough; and

a screen formed on an inner surface of said faceplate and including phosphor elements on which the deflected electron beams passing through said apertures land and which



emit light rays of different colors, said screen being defined by a plurality of continuous segment regions each of which is scanned with the electron beams emitted from said corresponding electron gun assembly and deflected by said corresponding deflection unit

wherein said electron gun assemblies adjacent each other are so arranged as to have a relative distance GS between the central axes thereof:

$$GS=m\cdot SG[(n-1)Ph+d]/Ph$$

where SG is a relative distance on the deflection plane, between the electron beams emitted from each of said electron gun assemblies, d is a distance between predetermined effective apertures of the shadow mask through which the predetermined electron beams pass, the predetermined electron beams landing on endmost adjacent effective phosphor elements in each two adjacent ones of said segment regions, and m and n are integers, respectively.

4,712,039

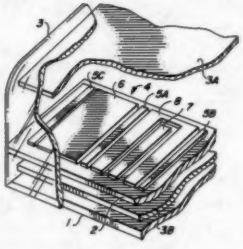
VACUUM INTEGRATED CIRCUIT

Lazaro M. Hong, 931 Kingston Dr., Fort Collins, Colo. 80525

Filed Apr. 11, 1986, Ser. No. 850,945

Int. Cl.[4] H01J *1/46, 21/10;* H01K *11/00*

U.S. Cl. 313—307 **16 Claims**



1. A vacuum integrated circuit comprising:

(a) an insulating substrate;

(b) a vacuum envelope for producing a vacuum over a surface of the substrate;
(c) cathode means on the surface for emitting electrons into the vacuum;
(d) grid means on the surface adjacent to the cathode means for controlling the velocity of emitted electrons;
(e) anode means on the surface adjacent to the grid means for collecting emitted electrons to produce an anode current; and
(f) electrostatic lens means on the surface adjacent to and in spaced relationship to the cathode means, grid means, and anode means for producing an electric field in the vacuum to control the trajectories of electrons emitted from the cathode means so that the electrons travel to the anode means and for preventing emitted electrons that are not collected by the anode means from charging up other surfaces in the vacuum.

4,712,040

CONNECTOR FOR HIGH PRESSURE LAMPS

Samuel A. Carleton, Bath, and Norman R. King, Hammondsport, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 19, 1985, Ser. No. 799,526
Int. Cl.[4] H01J *5/50*
U.S. Cl. 313—331 **4 Claims**

1. A high pressure discharge lamp comprising an arc tube disposed within an outer jacket, an electrode assembly at each end of said arc tube and a separate electrical connection to each of said electrode assemblies, each said connection for connecting said arc tube from the inside to the outside of the outer jacket, each said connection inside the jacket including wire connector means fixedly connected to its associated electrode assembly, each said wire connector means being formed of a bent wire having two separated legs joined at a common point and comprising a U-shaped wire with the bottom of the U bent back toward its open end, each said wire connector means being so disposed relative to its associated electrode assembly that expansion of said arc tube when the lamp is turned on forces said legs of said connector means closer together and contraction of said arc tube when the lamp is turned off forces said legs apart.

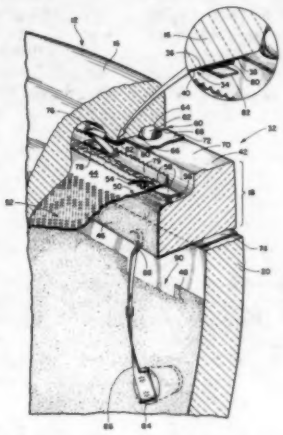
4,712,041

COLOR CRT TENSION MASK SUPPORT ASSEMBLY WITH A GLASS FRAME

Siegfried M. Greiner, Crystal Lake, and Kazimir Palac, Carpentersville, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 20, 1985, Ser. No. 754,787
Int. Cl.[4] H01J *29/07, 29/88*
U.S. Cl. 313—407 **11 Claims**

1. A front assembly for use in a color cathode ray tube, comprising:
a glass faceplate having a target area with patterns of phosphor deposits thereon covered with an electron-pervious electrically conductive metallic film;
a shadow mask support assembly including a glass frame for supporting a mask in precise spaced adjacency to said target area, said frame having at least a surface portion which is electrically conductive;
an electrically conductive foil shadow mask adapted to be charged with a high voltage and mounted in tension on said frame in electrical contact with said surface portion thereof; and



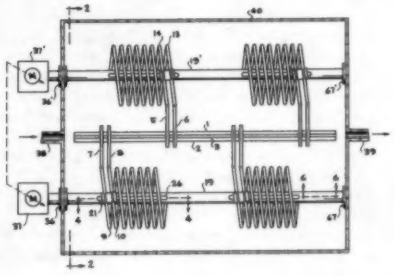
electrically conductive spring means supported by and in electrical contact with said mask and engaging said metallic film on said target area or a conductive extension thereof, for conducting high voltage on said mask to said metallic film.

4,712,042

VARIABLE FREQUENCY RFQ LINEAR ACCELERATOR

Robert W. Hamm, Pleasanton, Calif., assignor to AccSys Technology, Inc., Pleasanton, Calif.

Filed Feb. 3, 1986, Ser. No. 825,273
Int. Cl.[4] H05H *9/02, 7/12*
U.S. Cl. 315—5.41 **54 Claims**



1. A variable frequency RFQ linear accelerator for accelerating, focusing or bunching a beam of charged particles, comprising:
an evacuated vessel through which said beam of charged particles travels:
an even-numbered plurality of elongated electrodes, supported within said vessel in parallel relation to the trajectory of said beam of charged particles, said elecrodes being disposed azimuthally around said trajectory, said electrodes further having a structrue such that they produce an RFQ electric field useful for accelerating, focusing or bunching said beam of charged particles;

power supply means connected to said electrodes for supply radio-frequency elecrical power thereto, such that said electrodes are caused to generate said RFQ elecctric field by said power supply means;

variable inductance means having an inductance which may be varied over a substantial range, said variable inductance means being electrically communicative with said electrodes, such that said variable inductance means and said electrodes form an LC resonant circuit which oscillates at the frequency desired for said RFQ electric field, and said frequency may be varied by varying the inductance of said variable inductance means; and

inductance control means connected to said variable inductance means such that the inductance of said variable inductance means may be controlled from the exterior of said evacuated vessel.

4,712,043

ELECTRON GUN WITH LARGE APERTURE AUXILIARY ELECTRODE

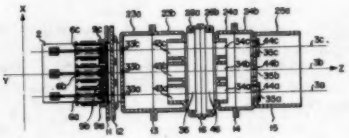
Shigeo Takenaka, and Eiji Kamohara, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 19, 1985, Ser. No. 702,725

Claims priority, application Japan, Feb. 20, 1984, 59-28611; Feb. 20, 1984, 59-28612; Mar. 29, 1984, 59-59441

Int. Cl.[4] H01J *29/46, 29/56*

U.S. Cl. 315—15 **11 Claims**



1. An electron gun comprising:

means for emitting three electron beams;

main lens means for focusing the electron beams, the main lens means having electron beam paths through which said electron beams pass and including first and second electrodes arranged along the beam paths, said first and second electrodes each having three apertures through which the respective electron beams pass, said main lens means further including an auxiliary electrode located between the first and second electrodes and having an aperture through which each of the electron beams pass, the diameter of the aperture of the auxiliary electrode being greater than the respective sums of the diameters of the three apertures of the first and second electrodes; and

voltage applying means for respectively applying first, second and auxiliary voltages to the first, second and auxiliary electrodes, the first, second and auxiliary voltages having different first, second and third voltage levels, respectively, thereby forming an electrostatic field between the first and second electrodes, wherein the third voltage level is higher than the first voltage level and lower than the second voltage level.

4,712,044

CIRCUIT FOR SEQUENTIALLY TURNING ON LAMPS ON AN AUTOMOBILE

Mark S. Phillips, 510 Budd Ave., Campbell, Calif. 95008

Filed Dec. 17, 1985, Ser. No. 810,108

Int. Cl.[4] B60Q *1/02*

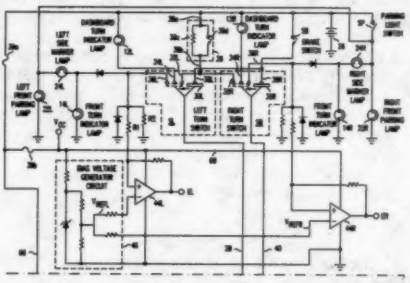
U.S. Cl. 315—82 **10 Claims**

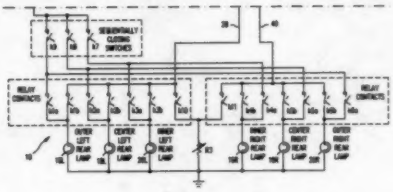
1. A circuit for controlling lamps mounted on a vehicle comprising:

a first lamp for indicating a turn;

a manually actuatable switch for signaling a turn, said manually actuatable switch coupling said first lamp to a voltage source when a turn is signaled;

means for sensing the voltage across said first lamp and generating a digital signal in response thereto when a turn is signaled;





a plurality of flip-flops adapted to be in either a first state or a second state, said flip-flops sequentially assuming said second state and then assuming said first state after each of said flip-flops is in said second state in response to the presence of said digital signal; and

a plurality of lamps turning on and off in response to the state of an associated one of said flip-flops.

4,712,045

ELECTRIC ARRANGEMENT FOR REGULATING THE LUMINOUS INTENSITY OF AT LEAST ONE DISCHARGE LAMP

Johannes M. Van Meurs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1986, Ser. No. 821,107

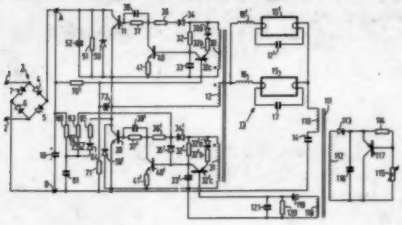
Claims priority, application Netherlands, Jan. 22, 1985, 8500155

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—224 **9 Claims**

1. An electric arrangement for regulating the luminous intensity of at least one discharge lamp comprising: a DC/AC converter circuit for the supply of high frequency energy to the discharge lamp, said DC/AC converter circuit having an input coupled to a source of supply voltage, at least one switching transistor and a first winding arranged to surround a core of magnetizable material, said winding being included in an electric circuit for the supply of the discharge lamp and said core further having a second winding coupled magnetically to the first winding, the core of magnetizable material having a third winding which is magnetically coupled to the second winding and is connected to a control device which controls the switching of the switching transistor of the DC/AC converter, the third winding being magnetically coupled to the

first winding, and a series-combination of a non-capacitive variable impedance and a diode connected between the ends of



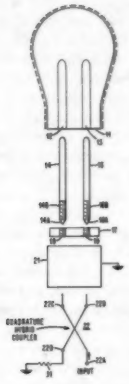
the second winding in a manner such that a manual adjustment of the variable impedance determines the voltage developed across the third winding.

4,712,046

QUADRATURE-COUPLED MICROWAVE ELECTRODELESS LAMP

Scott J. Butler, Rochdale; Robert K. Smith, Woburn, and Mehdy Abdollahian, Easton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 14, 1986, Ser. No. 930,487
Int. Cl.[4] H05B *41/16, 41/24*
U.S. Cl. 315—248 **9 Claims**



1. Electrodeless lamp apparatus adapted to operate at a microwave frequency f, having a wavelength λ which is proportional to the free space wavelength λ_0, said electrodeless lamp apparatus comprising

(a) a first conductor having a first end and a second end, said first conductor having a length L_1;

(b) a second conductor having a first end and a second end, said second conductor having a length L_2;

(c) an electrodeless lamp having an envelope made of light transmitting substance and a volatile fill material enclosed within said envelope, the fill material emitting light upon breakdown and excitation, said envelope having a pair of recesses for receiving the first ends of said conductors therewithin;

(d) a conductive mesh enclosing substantial portions of said electrodeless lamp;

(e) means for coupling said conductive mesh to a point of reference potential;

(f) means for applying a first voltage, at said wavelength λ, to the second end of said first conductor; and

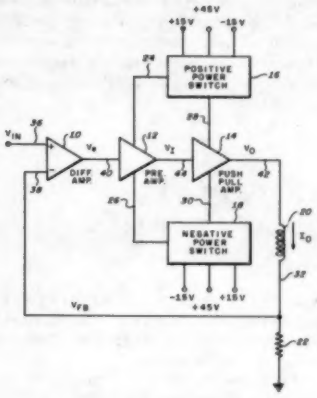
(g) means for applying a second voltage, at said wavelength λ, to the second end of said second conductor, whereby said first voltage and said second voltage are displaced from each other by ninety degrees.

4,712,047

POWER ON DEMAND BEAM DEFLECTION SYSTEM FOR DUAL MODE CRT DISPLAYS

Paul F. L. Weindorf, Albuquerque, N. Mex., assignor to Sperry Corporation, Great Neck, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,730
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—397 **7 Claims**



1. An electron beam magnetic deflection system for a display system controllably operable to provide deflection in a stroke mode for random deflection of the beam, a raster mode for periodic deflection of the beam, and a slew mode for traversing the beam at a maximum deflection rate, comprising:

input means, having an input terminal responsive to an input signal indicative of a desired deflection of the beam, for providing an output signal responsive to said input signal;

preamplifier means, comprising a buffer amplifier responsive to said output signal and providing an output current indicative of the magnitude and sense of said output signal, current source means, responsive to said output current, for providing a further output current opposite in sense to said output current, a plurality of cascaded diodes providing predetermined voltage drops and coupled to receive said further output current, for providing a plurality of predetermined bias voltages and a variable bias signal responsive to said input signal for energizing a deflection amplifier means;

said deflection amplifier means having first and second cascaded sections, coupled to receive ones of said bias voltages, for applying current to a deflection coil operatively coupled to said electron beam, and for providing a desired beam deflection in accordance with the sense and rate of change of said input signal;

a plurality of switch means, operable in non-saturated switching mode for selectively applying voltage sources of positive and negative polarity to said first and second cascaded sections, responsive to said further output current, from said preamplifier means, to said current in said deflection coil, and to a source of voltage derived from a difference of a voltage developed across said deflection coil and a voltage drop across one of said first or second sections of said deflection amplifier means, a predetermined one of said switch means being activated for a predetermined polarity of said deflection current when said derived voltage attains a first predetermined magnitude and polarity and deactivated when said derived voltage attains a second predetermined magnitude and

polarity, said first section of said deflection amplifier means coupled to ones of said switch means for energizing said electron beam in a first predetermined direction and said second section coupled to further ones of said plurality of switches for energizing said electron beam in a second predetermined direction; and

a plurality of voltage sources of predetermined magnitudes and first and second polarities, ones of said voltage sources coupled respectively to ones of said plurality of switch means, whereby a voltage source of sufficient magnitude is provided to said deflection amplifier means which allows sufficient current to flow through said deflection coil to accomplish the desired rate of change of beam deflection while maintaining linear operation of said deflection amplifier means and minimizing power consumption thereof, independent of the mode of operation of said display system.

4,712,048

PROCESS AND APPARATUS FOR CONTROLLING THE SPINDLE SPEED OF A GEAR CUTTING MACHINE

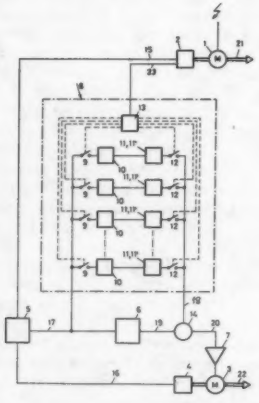
Roland Rebsamen, Greifensee, Switzerland, assignor to Reishauer AG., Zurich, Switzerland

Filed Jun. 19, 1986, Ser. No. 876,156

Claims priority, application Switzerland, Jun. 26, 1985, 2735/85

Int. Cl.[4] H02P 5/46

U.S. Cl. 318—85 **9 Claims**



1. An apparatus for controlling the rate of rotation of a spindle of a gear generating machine comprising a first spindle having a first angle of rotation transmitter connected thereto and a second spindle having a second angle of rotation transmitter connected thereto, controller means providing an output signal controlling a drive of the first spindle and storage circuit means including means for generating and storing a variable signal in discrete time intervals within a cycle (T) and adding circuit means for adding the storage content to the output signal of said controller means synchronously with an independent signal, wherein said storage circuit means comprises several storages and a multiplexer circuit which is controlled by said independent signal and is connected in series to said storages.

4,712,049

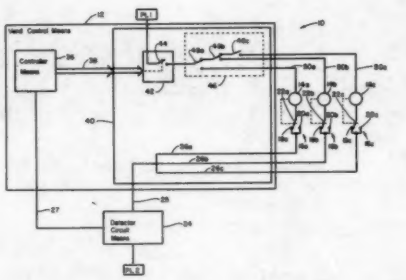
OPERATION COMPLETION DETECTION MEANS

Raymond L. Houserman, St. Louis, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Aug. 22, 1986, Ser. No. 899,495

Int. Cl.[4] H02P 3/06

U.S. Cl. 318—112 **8 Claims**



1. Operation completion detection means for a vend system including one or more individually controllably operable motors for performing a given type of operation, said operation completion detection means comprising power leads, vend control means including means for completing a circuit across said power leads through a given motor, cam operated switch means associated with and connected in series circuit with each motor, each cam operated switch means including first and second poles and a controllably movable contact normally in electrical contact with said first pole and responsive to operation of the motor with which such cam operated switch means is associated to switchably cycle between said poles during a complete operational cycle of such motor, said first and second poles being connected in common, and a detector circuit means having a monitor portion thereof operatively connected in common circuit to all of such motors and their associated cam operated switch means and in series circuit with each respective motor and its associated cam operated switch means, said vend control means being operable to effect the establishment of a power drive circuit to a given motor and its associated cam operated switch means and to thereby complete a motor driving circuit through said given motor and its associated cam operated switch means, such motor driving circuit initially comprising a first power circuit through said given motor and through the movable contact and first pole of the cam operated switch means associated therewith, the completion of said first power circuit initiates operation and the commencement of an operational cycle of such given motor, operation of such given motor thereafter effecting switchable movement of said movable contact of said associated cam operated switch means from said first pole to said second pole to break said first power circuit and to establish a second power circuit through such given motor and the movable contact and second pole of said associated cam operated switch means, whereupon said motor driving circuit comprises said second power circuit, further operation of such given motor effecting switchable movement of said movable contact from said second pole back to said first pole to break said second power circuit and to re-establish said first power circuit through such given motor and through the movable contact and first pole of the cam operated switch means associated therewith, whereupon said motor driving circuit again comprises said first power circuit, said switchable movement of said movable contact from said second pole to said first pole momentarily interrupting the motor driving circuit through said given motor and its associated cam operated switch means, said momentary circuit interruption of said motor driving circuit upon the movement of said movable contact from said second to said first pole being detectible by said detector

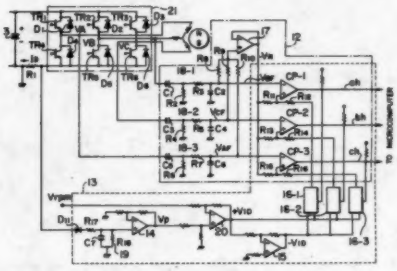
circuit means, said detector circuit means responsive to said momentary circuit interruption upon the movement of said movable contact from said second to said first pole to produce a home detection signal, said vend control means operatively connected to receive said home detection signal and responsive thereto to effect disestablishment of said power drive circuit to said given motor and its associated cam operated switch means.

4,712,050

CONTROL SYSTEM FOR BRUSHLESS DC MOTOR

Kiyoshi Nagasawa; Toru Inoue, both of Tochigi, and Susumu Kashiwazaki, Utsunomiya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1987, Ser. No. 9,290
Claims priority, application Japan, Mar. 17, 1986, 61-56804
Int. Cl.[4] H02K *29/06*
U.S. Cl. 318—254 11 Claims



1. A control system for brushless DC motors comprising:
a brushless DC motor having a field rotor and a plurality of stator windings;
a position detecting circuit for detecting counter electromotive force voltage signals generated in said stator windings as said field rotor rotates and generating rotor position detection signals on the basis of said counter electromotive force voltage signals;
a driver circuit connected to said stator windings of said motor and being responsive to said rotor position detection signals to control conduction of current from a DC power supply to said stator windings;
a current detecting circuit for detecting an input current to said driver circuit from said DC power supply;
a hold circuit for holding a maximum value of the detected input current; and
a phase correcting circuit for correcting the phase of said rotor position detection signal in accordance with the held value of said input current.

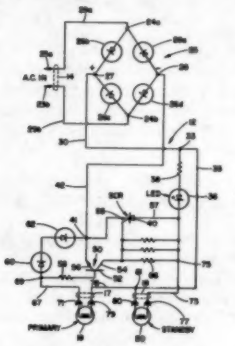
4,712,051

ADAPTER FOR SWITCHING FROM PRIMARY TO STANDBY DEVICE UPON FAILURE OF PRIMARY DEVICE

Saul S. Fathi, Huntington, N.Y., assignor to Ultima Electronics Ltd., Farmingdale, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,564
Int. Cl.[4] H05B *39/10*; G05B *9/02*
U.S. Cl. 318—564 5 Claims

1. An appliance adapter for maintaining in continuous, alternate operation primary and standby power consuming devices, comprising:
input terminals for applying alternating voltages from an external A.C. power source;
a full wave rectifier connected to said input terminals for rectifying said alternating voltage, said rectifier having a pair of output terminals;
first circuit means connected to said output terminals of said rectifier for applying rectified voltage to a primary power consuming device to keep the same in continuous operation;
second circuit means connected to said output terminals of said rectifier for applying rectified voltage to a standby power consuming device; and
automatic switching means connected in circuit with said first and second circuit means,
said automatic switching means comprising:
a transistor having a collector connected to said standby power consuming device, and an emitter connected to one of said rectifier output terminals and a base connected to said primary consuming device whereby said transistor is biased to cutoff when said primary consuming device is in operation and is biased to conduct when said primary consuming device fails, or is removed from said adapter;



a silcon controlled rectifier having an input connected to said standby power consuming device, and an output connected to said one of said rectifier inputs and a gate connected to said collector of said transistor; and
signal means having one end connected to the other of said rectifier inputs, and another end connected to said standby consuming device, whereby failure of said primary consuming device or removal thereof from said appliance adapter will cause said transistor to conduct and thereby connect said standby consuming device to said rectifier output means and simultaneously turn on said silicon controlled rectifier whereby said signal means are energized to indicate said standby power consuming device is operating.

4,712,052

DIGITAL SERVO-CONTROL SYSTEM

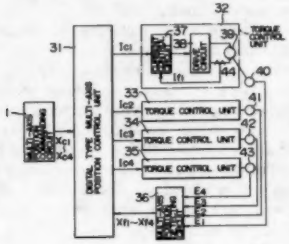
Tsutomu Omae, Hitachi; Sanshiro Obara, Ibaraki; Kenji Kubo, and Masahiko Watanabe, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,362
Claims priority, application Japan, Oct. 5, 1984, 59-208208
Int. Cl.[4] G05B *11/32*
U.S. Cl. 318—625 3 Claims

1. A digital servo-control system comprising:
a plurality of motors for driving a plurality of drive shafts of a machine, respectively;
position detection means for detecting a position of each of said plurality of drive shafts and producing a position signal;
multi-axis position commanding means for producing a position command signal indicative of a position command value for each of said plurality of drive shafts;
digital type multi-axis position control means for receiving said position signal and said position command signal, for computing a torque command value for each drive shaft on the basis of a position detection value contained in said

position signal and said position command value and for producing a torque command signal; and

torque control means, provided in correspondence with



each of said plurality of motors, for receiving said torque command signal and controlling an output torque of a corresponding motor in accordance with said torque command value contained in said torque command signal.

4,712,053

SERVO CONTROL FOR MOTOR HAVING CUTOFF DEVICE FOR PREVENTING MOTOR FROM BEING LOCKED

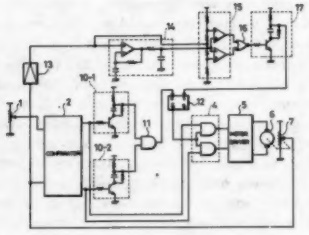
Hidetaka Numata, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 669,104, Nov. 7, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 906,559

Claims priority, application Japan, Nov. 8, 1983, 58-172972

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—663 **5 Claims**



1. A servo control connected to a motor driving circuit for driving the rotor of a motor to a desired position and for preventing the motor from being locked, comprising:

(a) a rotor position sensor connected to the rotor of the motor for providing a first signal indicative of the actual position of the rotor;

(b) a rotor position control which is set for providing a second signal indicative of a desired position to which the rotor is to be moved;

(c) a servo control portion including a comparator for comparing the first signal provided from the rotor position sensor to the second signal provided from the rotor position control and for supplying a driving signal to the motor driving circuit when said first signal differs from said second signal in order to bring the rotor to the desired position;

(d) a stop detector responsive to said first signal for detecting stoppage of the rotor, due to either the rotor having been moved to the desired position or to the motor becoming locked in position, in order to provide a detection signal indicating stoppage of the rotor; and

(e) a cutoff portion for cutting off current from being supplied to the motor from said motor driving circuit in response to the detection signal from the stop detector.

4,712,054

CONTROLLER WITH TWO MODES OF BRAKING INDUCTION MOTORS

Robert R. Boldt, Taylor Ridge, Ill., assignor to East Moline Metal Products Company, East Moline, Ill.

Filed May 14, 1986, Ser. No. 863,068

Int. Cl.[4] H02P *3/20, 5/40*

U.S. Cl. 318—758 **3 Claims**

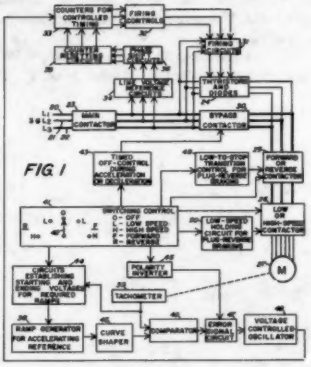


FIG. 1

1. A motor controller having improved firing means, a high-torque, two-speed, three-phase induction motor, thyristor means, said motor being connected to a three-phase power line through said thyristor means, said improved firing means controlling phases of firing said thyristor means, said motor controlling speed of a wide range of loads having torque in either forward or reverse direction with respect to the direction of running of said motor, said firing means including a firing circuit for developing ignition voltage, a ramp control means for developing a curve of voltage corresponding to a desired speed, a tachometer connected to said motor for developing a voltage proportional to actual speed, and a comparator having an output supplying the difference between said voltages for said desired speed and said actual speed, control switching means responsive to a stop command for connecting said motor to said thyristor means successively for regenerative and for reverse-running braking, firing timing means connected between said output of said comparator and said firing circuit for each phase of said power line to control times of firing, resetting means for each phase connected between said power line and said firing timing means,

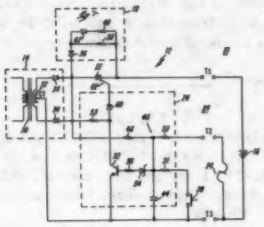
the improvement comprising a phase-shift circuit connecting each of said resetting means to a respective phase of said power line, each of said phase shift circuits delaying resetting of said firing timing means for a substantial portion of each one-half cycle occurring after respective alternate zero crossings of the respective phase of said power line, said alternate zero crossings being the zero crossings terminating those one-half cycles during which said thyristor means usually provides the greater amount of operating current while said motor is running, the delaying of each of said resettings permitting the initiation of firing even within the respective one-half cycles immediately following said alternate zero crossings such that only current that lags is conducted through said thyristor means and is controlled by said firing timing means in intervals of short enough duration to ensure smooth stopping of loads by reverse-running braking precisely at predetermined locations and also to ensure smooth starting of even those loads having torque in the direction of the running of said motor.

4,712,055

BATTERY CHARGER CIRCUIT

John Houser, Jr., Pickens, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 1, 1987, Ser. No. 32,674
Int. Cl.[4] H02J 7/10
U.S. Cl. 320—35 20 Claims



1. A battery charging apparatus for providing rapid charging and maintenance charging of a battery, comprising:

power source means generating a charging voltage for the battery;

gate controlled charging means for controllably providing a first, high, charging current to the battery, said gate controlled means connected in a series connection between the power source means and the battery;

maintenance charging means for providing a second, low, charging current to the battery, said second charging current having a lower magnitude than said first charging current, said maintenance charging means connected between the power source and the battery;

voltage storing means for storing a voltage to control said gate controlled charging means;

voltage supply means for providing a first voltage level to said voltage storing means for controlling said gate controlled charging means to a blocked state;

switch means for altering the voltage stored in said voltage storing means to a second voltage level for controlling said gate controlled charging means to a conducting state for charging the battery;

temperature sensing means for detecting temperature ranges corresponding to uncharged and charged states of the battery and for assuming respective first and second states responsive thereto,

said temperature sensing means operable in said first state for connecting said voltage supply means to a separate voltage level for supplying a voltage to said voltage storing means for maintaining said second voltage level provided thereto after operation of said switch means thereby controlling said gate controlled charging means to said conducting state; and

said temperature sensing means operable in said second state for disconnecting said voltage supply means from said separate voltage level and thereby to change a voltage on said voltage storing means to a value approaching said first voltage level for controlling said gate controlled charging means to said blocked state and for terminating a rapid charge operation of the charging apparatus; and

latching means for latching said gate controlled charging means to said blocked state in response to said second state of said temperature sensing means and for maintaining the voltage on said voltage storing means at said first voltage level when said temperature sensing means returns to said first state after being in said second state, thereby preventing said gate controlled charging means from providing said first charging current to the battery when said temperature sensing means is in said first state thereof after said second state thereof,

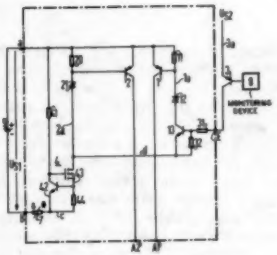
whereby said maintenance charging means provides said maintenance charging current to the battery when said temperature sensing means returns to said first state thereof from said second state.

4,712,056

SIGNALLING CIRCUIT

Heinrich Schott, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 16, 1985, Ser. No. 809,188
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446628
Int. Cl.[4] G05F 3/16
U.S. Cl. 323—315 12 Claims



1. A signalling circuit, comprising:

an input;

means for supplying either a first input criterion or a second input criterion at said input;

a reference potenital;

first and second outputs;

circuit means given said first input criterion for providing at said first output substantially said reference potential and at said second output a high resistance, or given the second input criterion, said circuit means providing substantially the reference potential at said second output and a high resistance at the first input; and

said circuit means comprising

a first electronic switch connected between said first output and said reference potential,

a second electronic switch connected between said second output and said reference potential,

a constant current circuit connected between a first operating voltage source and a parallel connection of a first current path and a second current path commonly fed by the constant current circuit,

means for connecting the first electronic switch to the first current path for control by current flowing in the first current path,

means for connecting the second electronic switch to the second current path for control by current flowing in the second current path, and

means connecting said input to said first and second current paths such that said first current path is conductive and said second current path is inhibited given said first input criterion and said second current path is conductive and said first current path is inhibited given said second input criterion.

4,712,057

METHOD OF EXAMINING AND TESTING AN ELECTRIC DEVICE SUCH AS AN INTEGRATED OR PRINTED CIRCUIT

Louis F. Pau, Grand-Lancy, Switzerland, assignor to Battelle Memorial Institute, Carouge/Geneva, Switzerland

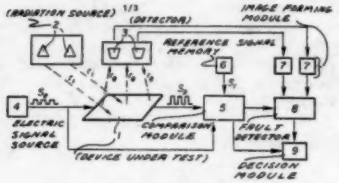
PCT No. PCT/CH84/00081, § 371 Date Jan. 18, 1985, § 102(e) Date Jan. 18, 1985, PCT Pub. No. WO84/04819, PCT Pub. Date Dec. 6, 1984

PCT Filed May 22, 1984, Ser. No. 705,341

Claims priority, application Switzerland, May 25, 1983, 2842/83

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—73 R **28 Claims**



1. A method of examining and testing a layered electric circuit device having signal processing capability at discontinuities contained internally of its layers of structure in which radiation emitted by the device itself, after stimulation, is detected by scanning, electric signals characteristic of the detected radiation are formed and the signals are compared with reference signals, said method being characterized in that:

said stimulation of the device comprises, in combination, sending a given electric signal through the device for signal processing therewithin and simultaneously irradiating the device with penetrating radiation from at least one source of radiation of a predetermined type and having predetermined characteristics,

the said radiation emitted by the device being the result of interaction of the applied irradiation with the material of the device structure through which the given electric signal travels at places where the structure has discontinuities.

4,712,058

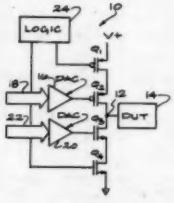
ACTIVE LOAD NETWORK

Christopher W. Branson, and Steven K. Sullivan, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 22, 1986, Ser. No. 888,908

Int. Cl.⁴ G01R *19/00*

U.S. Cl. 324—23 R **8 Claims**



1. An active load network for a digital test system comprising:

(a) logic circuit means for providing control signals based upon the expected logic output state of a device under test;

(b) a first active load circuit responsive to said control signals for providing a source of current to said device under test when a low level logic output signal is expected from said device under test;

(c) a second active load circuit responsive to said control signals for providing a current sink for said device under test when a high level logic output signal is expected from said device under test; and

(d) said first and second active load circuits each comprising a pair of CMOS transistors connected in series wherein one transistor in each CMOS transistor pair comprises a variable impedance gate for regulating the flow of current through each of said first and second active load circuits, and the other transistor in each CMOS transistor pair comprises an on/off switch for each respective active load circuit.

4,712,059

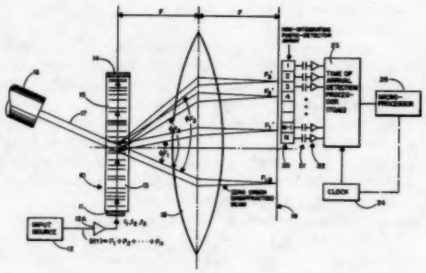
BROADBAND OPTICAL PROCESSOR FOR DETERMINATION OF FREQUENCY AND TIME OF ARRIVAL OF MULTIPLE SIGNALS

Joseph H. Labrum, West Jordan, Utah, assignor to Sperry Corporation, Blue Bell, Pa.

Filed Nov. 12, 1985, Ser. No. 796,997

Int. Cl.⁴ G01R *23/16*

U.S. Cl. 324—77 K **14 Claims**



1. An optical signal processor comprising,

light source means,

an acousto-optic cell disposed to receive and selectively transmit light beams from said light source means,

signal source means connected to said acousto-optic cell to generate acoustic waves through said acousto-optic cell transverse to said light beam in order to affect the transmission of light beams through said acousto-optic cell,

a Fourier transform lens adjacent to said acousto-optic cell to focus the light beams transmitted by said acousto-optic cell,

a photodetector array means disposed at the Fourier transform focal plane of said lens and operative to produce electrical signals in response to receipt of light beams,

differentiating means connected to said photodetector array means and operative to differentiate said electrical signals produced by said photodetector array means, and

a time of arrival processing system connected to receive signals from said array means via said differentiating means and to process the signals in the order of arrival.

4,712,060

SAMPLING AVERAGE PHASE METER

Rick S. Bailey, and Arthur C. Holly, both of Austin, Tex., assignors to Board of Regents The University of Texas System, Austin, Tex.

Filed Aug. 29, 1986, Ser. No. 902,187

Int. Cl.⁴ G01R *25/00*

U.S. Cl. 324—83 R **2 Claims**

1. A phase measurement device for measuring the phase of a pulsed single-frequency sinusoidal input signal, the device comprising:

a first zero-crossing detector means responsive to the input

signal for generating a first square wave having the same phase as the phase of the input signal;

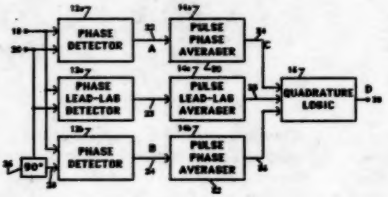
a second zero-crossing detector means responsive to a reference signal for generating a second square wave having the same phase as the phase of the reference signal;

shifting means responsive to the reference signal for generating a quadrature signal wherein the phase of the quadrature signal is shifted 90° from the phase of the reference signal;

a third zero-crossing detector means responsive to the quadrature signal for generating a third square wave having the same phase as the phase of the quadrature signal;

a first exclusive-or means electrically coupled to the first and second zero-crossing detector means and responsive to the first and second square waves for generating a first pulse train having pulse widths proportional to the absolute value of the phase difference between the first and second square waves;

a second exclusive-or means electrically coupled to the second and third zero-crossing detector means and responsive to the second square wave and the third square wave for generating a second pulse train having pulse widths proportional to the absolute value of the phase difference between the second and third square waves;



sign means electrically coupled to the first and second zero-crossing detector means and responsive to the first and second square waves for generating the sign of the phase of the input signal;

a first analog averager means electrically coupled to the first exclusive-or means and responsive to the first pulse train for generating a first average pulse train proportional to the phase difference between the input signal and the reference signal;

a second analog averager means electrically coupled to the second exclusive-or means and responsive to the second pulse train for generating a second average pulse train proportional to the phase difference between the input signal and the quadrature signal;

a first analog pulse integrator means electrically coupled to the first averager means and responsive to the first average pulse train for generating a first average;

a second analog pulse integrator means electrically coupled to the second averager means and responsive to the second average pulse train for generating a second average;

an analog quadrature logic means responsive to the first and second average for generating a voltage proportional to the phase of the input signal.

4,712,061

SMALL PROPAGATION DELAY MEASUREMENT FOR DIGITAL LOGIC

Lawrence E. Lach, Chicago, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 24, 1986, Ser. No. 831,898

Int. Cl.[4] G01R *25/00*

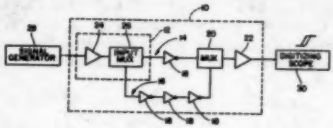
U.S. Cl. 324—83 D **28 Claims**

1. A circuit for measuring small propagation delays associated with a digital logic circuit comprising:

first signal path in the digital logic circuit having at least a first predetermined number of devices and having an input and an output;

second signal path in the digital logic circuit having at least a second predetermined number of devices different from said first predetermined number of devices and having an input and an output;

input means for supplying a predetermined input signal to said inputs of said first and second signal paths, thereby producing first and second output signals on said outputs of said first and second signal paths;



output means operatively connected to said outputs of said first and second signal paths for multiplexing said first and second output signals to alternately combine said first and second output signals into a multiplexed output signal; and

means for comparing said output signals in said multiplexed output signal operatively connected to an output of said output means for multiplexing to produce an average propagation delay of said devices in said first and second signal paths.

4,712,062

GROUND SHIELD APPARATUS FOR GIGA-HERTZ TEST JIG

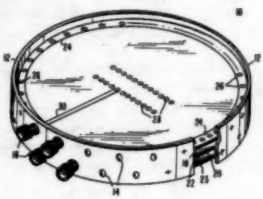
Henry K. Takamine, Gardena, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 20, 1984, Ser. No. 684,767

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[4] G01R *1/04, 31/02*

U.S. Cl. 324—158 F **11 Claims**



1. A test jig comprising:

a disc of metal having two substantially planar major surfaces;

a first substantially coextensive dielectric layer on one surface of the disc, said first dielectric layer having a plurality of signal traces formed on an outer surface of the layer which generally radiate outwardly from a centrally located test device receiving area, and the layer further including metallic ground means on peripheral portions thereof:

a second substantially coextensive dielectric layer on an opposite major surface of the disc, said second dielectric layer having a plurality of signal traces and metallic ground means on peripheral portions of said second dielectric layer;

a metallic annular member surrounding said disc and dielectric layers having a wall extending in a direction transverse thereto;

means for physically and electrically connecting the wall of the annular member to edges of the disc and the metallic ground means on the first and second dielectric layers;

a plurality of external connectors mounted in the wall, each connector being coupled to a given trace on one of the dielectric layers; and

a ground shield means disposed between signal traces on the dielectric layers for providing electrostatic and electromagnetic isolation.

4,712,063

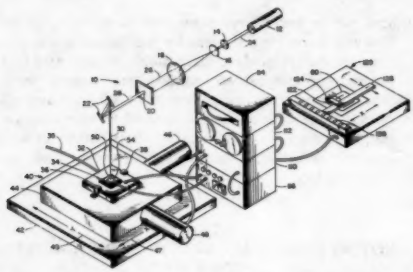
METHOD AND APPARATUS FOR MEASURING AREAS OF PHOTOELECTRIC CELLS AND PHOTOELECTRIC CELL PERFORMANCE PARAMETERS

Carl R. Osterwald, Lakewood, and Keith A. Emery, Fort Collins, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,506

Int. Cl.[4] G01R *31/26*; H01J *3/14*

U.S. Cl. 324—158 D **18 Claims**



1. Apparatus for mapping and quantifying effective current-producing cell area of a photovoltaic device in response to irradiation of the device, comprising:

translation stage means for supporting the photovoltaic device thereon, said translation stage means including drive means for moving said photovoltaic device intermittently in precisely measured spacial increments in orthogonal directions in response to motion implementing signals;

radiation producing means adjacent said translation stage for producing a coherent beam of radiation in a fixed position directed substantially normal to said translation stage onto said photovoltaic device in a focused incident spot having a precise, unvarying diameter, a precise, unvarying shape, and a precise unvarying intensity on the photovoltaic device;

signal generating means connected to said drive means for producing intermittent motion implementing signals for said drive means to sequentially move said translation stage in uniform precisely spaced discrete increments of distance in selected orthogonal directions not less than the diameter of said incident spot and for stopping the movement after each discrete increment of distance for an increment of time, such that said incident spot is focused sequentially on adjacent discrete areas of uniform size on said photovoltaic device for fixed increments of time;

electronic sensing means for sensing and measuring the magnitude of electric current response produced by said photovoltaic device in response to irradiation of said photovoltaic device by said beam of radiation at each geometric position on said photovoltaic device between incremental movements thereof; and

computer means for producing said motion implementing signal, for correlating and storing measured current response along with said respective geometric positions, for sorting into a group specific geometric positions from which current response is measured, utilizing the increments of movement for determining the dimensions and area of each of such geometric positions from which current response is measured, and totalling the areas of such geometric positions to obtain a total area of the photovoltaic device from which current response is produced.

4,712,064

MAGNETORESISTIVE SENSOR FOR DETECTING POSITION OR SPEED OF A FERROMAGNETIC BODY

Dieter Eckardt, Nuremberg, and Gerhard Hettich, Rosstal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

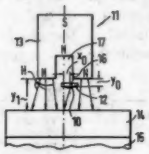
PCT No. PCT/DE85/00132, § 371 Date Feb. 26, 1986, § 102(e) Date Feb. 26, 1986, PCT Pub. No. WO86/00877, PCT Pub. Date Feb. 13, 1986

PCT Filed Apr. 25, 1985, Ser. No. 852,629

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426784

Int. Cl.[4] G01B *7/14*; G01R *33/02*; H01L *43/00*

U.S. Cl. 324—208 **16 Claims**



1. Magnetoresistive sensor for detecting position or speed of a movable ferromagnetic body, comprising at least one stationary magnetoresistive strip arranged in a plane; a stationary source of a constant magnetic field (H) whose main magnetic field component (Hy) extends substantially perpendicularly to the plane of said strip and whose relatively small secondary magnetic field component (Hx) extends in said plane; means for feeding a measuring electric current in one direction through said strip; said ferromagnetic body being movable from a starting position opposite said plane of the strip to produce therein, in combination with said secondary magnetic field component, a measuring magnetic field component (Ht) whose direction varies in dependence on position changes of said ferromagnetic body, thus causing a corresponding change of said measuring electric current.

4,712,065

MAGNETIC FIELD SENSORS, IN PARTICULAR OPTICAL FIBER MAGNETOMETERS

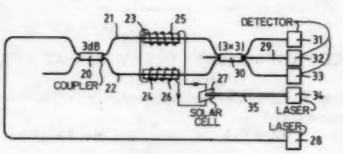
Gillies D. Pitt, Hewelsfield; Philip Extance, Shirley, and Roger E. Jones, Little Shelford, all of England, assignors to STC plc, London, England

Filed Feb. 20, 1986, Ser. No. 831,263

Claims priority, application United Kingdom, Feb. 23, 1985, 8504727

Int. Cl.[4] G01R *33/02*; G02B *5/30*; G02F *1/29, 1/31*

U.S. Cl. 324—244 **8 Claims**



1. A magnetic field sensor including a signal mode optical fiber, a portion of which is magnetically sensitised by being associated with magnetostrictive material, and means for gen-

erating a bias magnetic field at said portion, which means is optically powered.

4,712,066

METHOD FOR THE SELECTIVE EXCITATION OF A VOLUME IN AN OBJECT

Peter R. Luyten, and Jan A. Den Hollander, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1986, Ser. No. 894,247

Claims priority, application Netherlands, Aug. 12, 1985, 8502223

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 6 Claims

1. In a method for selective excitation of a region of an object which is arranged in a uniform, static magnetic field wherein r.f. electromagnetic pulses and gradient magnetic fields are generated for selective excitation of said region, the improvement comprising generating a non-selective 90° pulse, applying a gradient magnetic field which dephases spin nuclei, then generating a non-selective 180° pulse and subsequently genrating a selective 90 ° pulse in the presence of a similar gradient field.

4,712,067

R.F. COIL SYSTEM FOR GENERATING AND/OR RECEIVING ALTERNATING MAGNETIC FIELDS

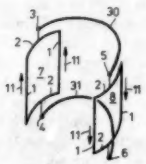
Peter Roschmann, Hamburg, Fed. Rep. of Germany, and Howard E. Simon, Monroe, Conn., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,199

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347597

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 40 Claims



1. An RF coil system for generating and/or receiving substantially homogeneous alternating magnetic fields, said system comprising at least four elongated conductor segments disposed about an approximately cylindrical space having a central, longitudinal axis, said conductor segments extending approximately parallel to said central axis and being arranged symmetrically with respect to at least one symmetry plane which extends through said central axis, and means for interconnecting said conductor segments so as to form a closed loop, said interconnecting means comprising a plurality of conductor elements which interconnect adjacent ends of said conductor segments so as to form at least two conductor groups and a plurality of connecting lead which interconnect said conductor groups, said connecting leads being connected to respective conductor elements and having a length such that when an RF current is applied to said coil system, there is a RF current amplitude maximum at approximately the center of each conductor segment and at least one RF current amplitude minimum on each connecting lead.

4,712,068

RF COIL ARRANGEMENT FOR NMR EXAMINATION APPARATUS

Matti Savelainen, Espoo, Finland, assignor to Instrumentarium Corp., Finland

Filed Jul. 6, 1984, Ser. No. 628,478

Claims priority, application Finland, Jul. 7, 1983, 832499

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 11 Claims

1. A radio frequency coil arrangement for an NMR apparatus for examining a target, said apparatus having a homogeneous basic magnetic field, said coil arrangement receiving the target and being coupleable to an rf generator for transmitting an rf signal and to an rf receiver for receiving and detecting an NMR signal generated in the target, said coil arrangement comprising:

a coil form having a central axis of revolution, first and second circular ends spaced along said central axis, and a surface of revolution extending between said spaced coil form ends, said coil form being positionable in the NMR apparatus with said axis of revolution lying parallel to the basic magnetic field;

a coil formed of rf transmission line applied to said surface of revolution, said coil having a plurality of turns, each of said turns comprising a pair of series connected segments, one of said segments extending from said first coil form end to said second coil form end, the other of said segments extending from said second coil form end to said first coil form end, said segments of each turn lying at angles to each other and being skewed with respect to the axis of revolution, the turns of said coil being circumferentially spaced about said surface of revolution with the corresponding segments of the turns lying generally parallel to each other, all said segments lying on said coil form and forming active elements of said coil, said transmission line having ends, said transmission line ends being coupled together; and

means for energizing said coil to produce a rotating rf field by utilizing phase differences created in said transmission line, said rotating rf field lying at an angle to the basic magnetic field.

4,712,069

MAGNETIC RESONANCE IMAGING APPARATUS INCLUDING TWO ORTHOGONAL R.F. COILS

Rudolf Kemner, and Hilco T. Kalmijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 18, 1986, Ser. No. 841,132

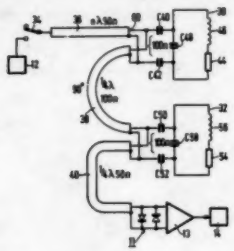
Claims priority, application Netherlands, Mar. 22, 1985, 8500844

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—322 7 Claims

1. A magnetic resonance imaging apparatus comprising a system of magnets for generating a static main magnetic field, an r.f. coil system which includes two mutually orthogonal coils for excitation and detection of magnetic resonance signals, a source of r.f. power, means for detecting the resonance signals and connecting means for connecting the r.f. coil system to the r.f. power source and to the detecting means, said

connecting means including a first ¼λ conductor which interconnects the two orthogonal coils and a second ¼λ conductor



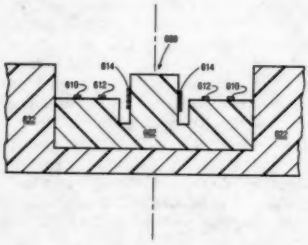
which connects one of the two orthogonal coils to said detecting means.

4,712,070

APPARATUS FOR MICROINDUCTIVE INVESTIGATION OF EARTH FORMATIONS

Brian Clark, Ridgefield, and Weng C. Chew, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed May 31, 1984, Ser. No. 616,323
Int. Cl.⁴ G01V *3/12*
U.S. Cl. 324—338 **21 Claims**



1. An apparatus for investigating a characteristic of earth formations traversed by a borehole, comprising:

a body having a borehole wall-engaging face;

means for applying said body to the borehole wall with said exterior face against the borehole wall;

an antenna set for coupling electromagnetic energy with a formation engaged by said wall-engaging face, and mounted in said body, comprising:

a first antenna element for coupling electromagnetic energy;

a second antenna element having a first location selected with respect to said first antenna element, for coupling electromagnetic energy; and

a third antenna element having a second location selected with respect to said first antenna element, for coupling electromagnetic energy; wherein said first and second locations are selected to place said second and third antenna elements in electromagnetic symmetry relative to said first antenna element and parallel thereto; and

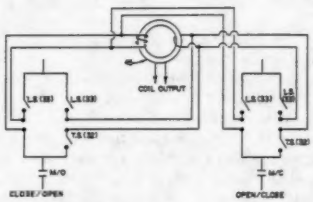
means for differentially coupling said second and third antenna elements.

4,712,071

MOTOR OPERATED VALVE ANALYSIS AND TESTING SYSTEM

Arthur G. Charbonneau, Marietta; Dwaine A. Godfrey, Fulton; John A. McNennamy, Cobb, and Steven Nafziger, Gwinnett, all of Ga., assignors to Charbonneau & Godfrey Associates, Marietta, Ga.

Division of Ser. No. 741,861, Jun. 6, 1985, Pat. No. 4,690,003, which is a continuation of Ser. No. 515,358, Jul. 19, 1983, Pat. No. 4,542,649. This application Feb. 24, 1987, Ser. No. 17,937
Int. Cl.⁴ G01R *19/00*; G01M *19/00*
U.S. Cl. 324—415 **4 Claims**



1. A switch position indicating circuit for detecting the open and closed positions of limit switches and torque switches within the valve operator of a valve system, wherein the valve operator includes a close-to-open circuit and an open-to-close circuit each of which includes a first circuit branch in parallel with a second circuit branch, a first limit switch positioned in said first circuit branch and a series combination of a second limit switch and a torque switch positioned in said second circuit branch and wherein current is allowed to flow only in the alternative through the close-to-open circuit and the open-to-close circuit to open the valve and close the valve, respectively; said switch position indicating circuit comprising:

a coil means for generating a measurable coil output,

said coil means including a core element, a first wire element wrapped about said core element, and a second wire element wrapped about said core element,

said first wire element being wrapped about said core element more times than is said second wire element;

first current conducting means for connecting said first wire element to the first circuit branch of the close-to-open circuit, whereby if current flows through the first limit switch current also flows through said wire element,

second current conducting means for connecting said second wire element to the second circuit branch of said close-to-open circuit, whereby if current flows through said second circuit branch current also flows through said second wire element; and

means for measuring said coil output generated by said coil means in response to the current flow through said first and second wire elements.

4,712,072

TIMER APPARATUS

Tetsuya Kawanabe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,493
Claims priority, application Japan, Oct. 30, 1984, 59-226647
Int. Cl.⁴ G06M *3/02, 3/08*
U.S. Cl. 328—130.1 **5 Claims**

1. A timer apparatus comprising:

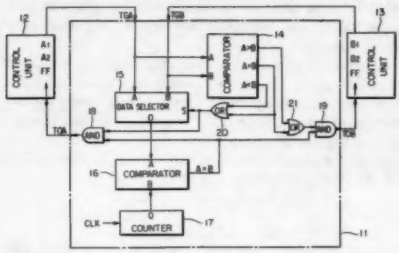
a plurality of control means for requesting timer services;

data selecting and comparing means coupled to said plurality of control means which upon receiving control means requests, compares them and priortizes the timer services according to an ordered hierarchy of time determined

from said plurality of control means and provides a data output and a first control signal, respectively;

timer means for providing timing data according to a time period;

comparator means for comparing data from said selecting and comparing means and providing a second control signal with data from said timer means; and



output means for outputting a signal to respective control means to execute control means services upon coincidence of the first and second control signals from said comparator means and said data selecting and comparing means, respectively.

4,712,073

FREQUENCY MULTIPLYING CIRCUIT

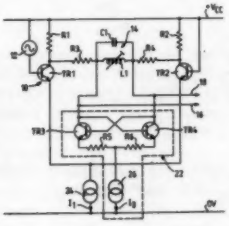
Herman W. Van Rumpt, Eindhoven, Netherlands, and Charles J. H. Razzell, Cambridge, United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,834

Claims priority, application United Kingdom, Oct. 7, 1983, 8326823

Int. Cl.[4] H03B *1/26*; H03F *3/10*

U.S. Cl. 328—160 **5 Claims**



1. A frequency multiplying circuit comprising a differential amplifier circuit including first and second active elements of the same conductivity type, each of said first and second active elements having a control electrode, an input electrode and an output electrode, an oscillator circuit connected to the control electrode of the first active element, a resonant circuit coupled between the output electrodes of the first and second active elements, the resonant circuit being tunable to the oscillator's frequency or to an odd harmonic thereof, an output being derived from ends of said resonant circuit, and a negative resistance circuit being connected across first and second ends of said resonant circuit to reduce the effect of a load of a following stage connected to the output, said negative resistance circuit comprising third and fourth active elements of the same conductivity type, each of said third and fourth active elements having an input electrode, an output electrode and a control electrode, a current source coupled to said input electrodes of the third and fourth active elements, the output electrodes of said third and fourth active elements are connected one to each end of the resonant circuit and the control electrodes of said third and fourth active elements are cross-connected to the output electrode of the other of the third and fourth active elements, and resistive devices connected respectively between the input electrodes of the third and fourth active elements and said current source.

4,712,074

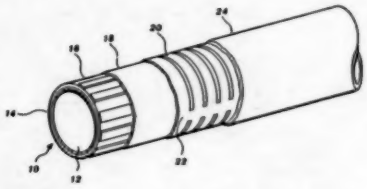
VACUUM CHAMBER FOR CONTAINING PARTICLE BEAMS

Alexander Harvey, Los Alamos, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 26, 1985, Ser. No. 801,881

Int. Cl.[4] H05H *1/10, 13/04*; H01J *5/02*

U.S. Cl. 328—233 **17 Claims**



1. A vacuum chamber for containing and stabilizing a charged particle beam in a rapidly changing magnetic environment comprising:

a. a ceramic pipe;

b. conducting strips oriented substantially parallel to and coaxial with the longitudinal axis of said pipe; and

c. circumferential conducting bands insulatively separated from said conducting strips, oriented in a direction perpendicular to the longitudinal axis of said pipe, and joined together by a single longitudinal electrical connection.

4,712,075

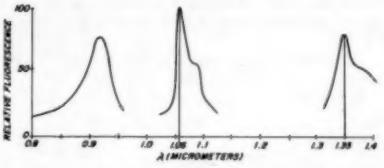
OPTICAL AMPLIFIER

Elias Snitzer, Wellesley, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 27, 1985, Ser. No. 802,369

Int. Cl.[4] H01S *3/00*

U.S. Cl. 330—4.3 **18 Claims**



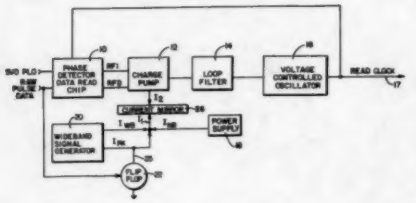
1. A device for amplifying optional signals within a select communication band, said device comprising a resonant optical waveguide cavity having a core containing an active gain material with given absorption and fluorescence spectrums, said active gain material having at least two emission bands which originate from the same upper energy level with one of said emission bands encompassing said select communication band, and said cavity being structured for resonating wavelengths in both said emission bands and for providing a more favorable combination of cavity Q and gain coefficent for resonant wavelengths in said other band than for resonant wavelengths corresponding to said select communication band such that, upon introduction into said cavity of pumping energy within said absorption band and at or above laser threshold for said other emission band, said cavity lases at wavelengths in said other emission band and thereby retains the

atomic population of said emission band corresponding to said select communication band at a value below its lasing threshold for amplifying, independent of the level of pump power introduced into said cavity, signals which are within said select communication band and present in said cavity.

4,712,076
CIRCUIT FOR PHASE LOCKING A CLOCK SIGNAL TO A SERIES OF PULSES

Robert D. Cronch, and Larry J. Koudele, both of Oklahoma City, Okla., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Oct. 27, 1986, Ser. No. 923,784
Int. Cl.[4] H03L *7/08*
U.S. Cl. 331—16 **20 Claims**



1. A circuit for phase locking a clock signal to the phase of a series of sync pulses, comprising:

means for producing a clock signal having a frequency responsive to a first signal;

means for comparing the phase of the clock signal to the phase of the series of sync pulses and producing a second signal responsive to the phase relation of the clock signal and the series of sync pulses;

means for generating a third signal of decreasing value during the presence of the sync pulses;

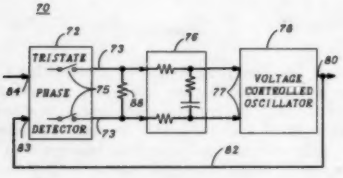
means for providing a fourth signal; and

means for adjusting the level of said first signal in response to the second, third, and fourth signals.

4,712,077
TRISTATE PHASE-LOCK LOOP PREVENTS FALSE LOCK

Henry G. Ansell, Exeter Township, Berks County, Pa., and Jeffrey H. Saunders, Methuen, Mass., assignors to American Telephone and Telegraph Company, AT&T Bell Labs, Murray Hill, Pa.

Filed Dec. 22, 1986, Ser. No. 945,032
Int. Cl.[4] H03L *7/10*
U.S. Cl. 331—25 **12 Claims**



1. A phase-lock loop comprising

a tristate phase detector having a data input terminal, a feedback terminal and an output terminal;

a filter having input and output terminals, the filter input terminal being connected with the output terminal of the tristate phase detector for receiving a control signal while ones are being applied to the data input terminal and being disconnected from the output terminal of the tristate phase detector while zeros are being applied to the data input terminal;

a voltage-controlled oscillator having a tuning control signal input terminal and regenerating a clock signal within a desired frequency range independent of the ones density applied to the data signal input terminal, the tuning control signal input terminal being connected with the output terminal of the filter for receiving a tuning control signal;

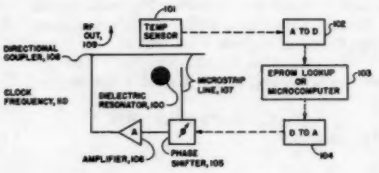
means for coupling the clock signal from the clock output terminal to the feedback terminal of the tristate phase detector; and

an impedance coupling a reference voltage to the input terminal of the filter as a supplementary control signal for clamping the tuning control signal and thereby forcing the oscillator to oscillate at a frequency within the desired frequency range independent of the ones density in the digital sequence applied to the data signal input terminal of the phase-lock loop.

4,712,078
DIELECTRIC RESONATOR OSCILLATORS WITH DIGITAL TEMPERATURE COMPENSATION

Andrew J. Slobodnik, Jr., Londonderry, N.H.; Martin R. Stiglitz, Lexington, Mass.; George A. Roberts, Weston, Mass., and Richard T. Webster, Bedford, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1985, Ser. No. 716,729
Int. Cl.[4] H03B *5/18*; H03L *1/02*
U.S. Cl. 331—99 **13 Claims**



1. In combination with a dielectric resonator oscillator including a dielectric resonator which oscillates to produce a radio frequency (RF) clock signal which has phase shift characteristics corresponding to a resonant frequency, said resonant frequency having a frequency drift with changes in ambient temperature, said dielectric resonator oscillator including microstrip lines which are electrically connected in series with a directional coupler, said microstrip lines being placed in proximity to said dielectric resonator which couples said radio frequency clock signal between said microstrip lines thus closing the oscillator loop, a temperature compensation feedback circuit which reduces temperature sensitivity and frequency drift in said clock signal, said temperature compensation feedback circuit comprising:

a temperature sensing means which produces an output signal which indicates the ambient temperature, said output signal being a temperature reading;

a correlation menas which is electrically connected in series with said temperature sensing means, and which receives said temperature reading from said temperature sensing means, and produces an output signal which indicates an amount of phase adjustment which is necessary in said clock signal to eliminate frequency drift due to changes in the ambient temperature;

a digital-to-analog converter which is electrically connected in series with said correlation means, and which receives said output signal from said correlation means, and converts it into an analog signal;

a phase shifter which is electrically connected in series with said digital-to-analog converter, and which receives said clock signal and said analog signal from said digital-to-

analog converter, said phase shifter also being electrically connected with said microstrip lines, and outputting an adjusted clock signal which compensates for the phase shift in the dielectric resonator due to changes in the ambient temperature; and

an ampliifer which is electrically connected in series between said phase shifter and said directional coupler, and which produces an output by receiving and amplifying said adjusted clock signal from said phase shifter.

4,712,079

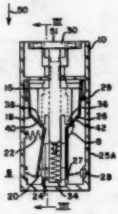
MOTOR CONTROLLER AUXILIARY CONTACT UNIT WITH FLEXURE MEMBER

Terry L. Marquardt, Batavia, Ill., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1986, Ser. No. 858,136

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—132 **3 Claims**



1. An auxiliary contact assembly of the type which is detachably attached to an electrical apparatus which has a movable portion for mechanically engaging and linearly moving a portion of the auxiliary contact assembly for causing contact status within said auxiliary contact assembly to change, comprising:

insulating base means;

spaced terminal means disposed on said insulating base means;

electrically conducting flexure means with an offset portion disposed on said insulating base means in a disposition of fixed electrical continuity with one of said spaced terminal means and controllable flexed electrical continuity with the other of said spaced terminal means for establishing electrical continuity therebetween; and

stroker means linearly movable within said insulating base means in cooperation with said movable portion and having a cam surface which intercepts said offset portion and moves said flexure means for affecting the establishment of said electrical continuity between said spaced terminal means and for remaining in a disposition of interception with said offset portion after said electrical continuity has been established and while said stroker means continues linear movement for causing further flexing of said flexure means for wiping said other of said spaced terminal means.

4,712,080

DEFLECTING YOKE

Akito Katou, Ashiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 24, 1986, Ser. No. 945,952

Claims priority, application Japan, Dec. 25, 1985, 60-201802[U]

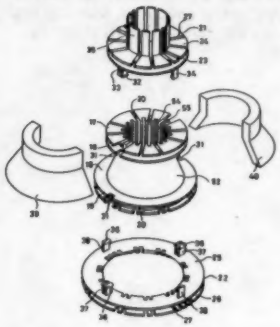
Int. Cl.[4] H01F *5/02*

U.S. Cl. 335—213 **6 Claims**

1. A deflecting yoke comprising:

a coil form for holding a horizontal deflection coil and a vertical deflection coil in plural slots extended along the inside of said coil form shaped so as to flare outwardly with respect to a direction along a central longitudinal axis, and having coil head chambers for winding one of the horizontal deflection coil and the vertical deflection coil, which are formed by walls disposed on both end parts of said slots,

a rear bobbin connected to said coil form by connecting means for winding one of the horizontal deflection coil and the vertical deflection coil in a coil head chamber



formed by two walls disposed around said rear bobbin, and

a front bobbin connected to said coil form by connecting means for winding one of the horizontal deflection coil and the vertical deflection coil in a coil head chamber formed by two walls disposed around said front bobbin.

4,712,081

BLADE FUSE ASSEMBLY WITH INDICATOR

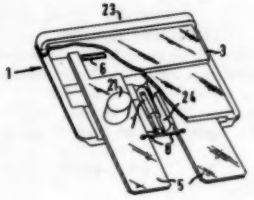
Sydney S. Bosley, 67 Holly Ave., New-Haw, Weybridge, Surrey, England

Filed Jul. 11, 1986, Ser. No. 884,380

Claims priority, application United Kingdom, Jul. 12, 1985, 8517590

Int. Cl.[4] H01H *85/32*

U.S. Cl. 337—266 **10 Claims**



1. A blade fuse assembly comprising:

(a) a light conducting fuse housing including a top portion and a base portion,

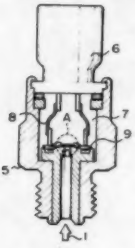
(b) a pair of spaced apart contact legs disposed partially within said fuse housing and having end portions extending outwardly from said base portion of said fuse housing for effecting electrical contact,

(c) a fusible member disposed within said fuse housing electrically connecting said contact legs to one another,

(d) said fuse housing having structure defining a pocket therewithin, said pocket being disposed between said contact legs and in said base portion of said fuse housing below said fusible member, and

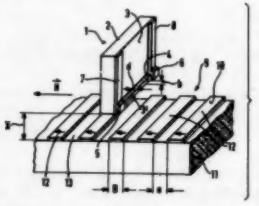
(e) an electrically activatable light emitting member positioned within said pocket and electrically connecting said contact legs in parallel with said fusible member, wherein upon failure of said fusible member, said light emitting member will activate to emit light within said fuse housing causing said entire light conducting fuse housing to glow.

4,712,082
PRESSURE SENSOR
Novsei Ito; Minoru Nishida, both of Okazaki; Naohito Mizuno, Nishio, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Mar. 21, 1986, Ser. No. 842,175
Claims priority, application Japan, Mar. 25, 1985, 60-58499
Int. Cl.[4] G01L 1/22; H01L 10/10
U.S. Cl. 338—4 3 Claims



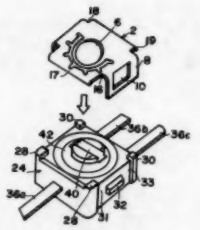
1. A pressure sensor comprising:
a metal tube having one end portion open and the other end portion closed by a metal diaphragm having a thermal expansion coefficient ranging from about 2.0×10^{-6}°C.$^{-1}$ to about 6.0×10^{-6}°C.$^{-1}$, a pressure to be inspected being introduced into said open end portion of said metal tube and applied to said metal diaphragm;
a glass layer bonded to a surface of said metal diaphragm opposite to the pressure application side of the metal diaphragm, the thermal expansion coefficient of said glass layer ranging from about 2.0×10^{-6}°C.$^{-1}$ to about 6.0×10^{-6}°C.$^{-1}$; and
a semiconductor chip acting as a semiconductor strain gauge bonded to the surface of said glass layer opposite said diaphragm.

4,712,083
POSITION SENSOR
Wolfgang Heck, Gerlingen; Peter Kersten, Leonberg, and Hans Volz, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Alcatel N. V., Amsterdam, Netherlands
Filed Dec. 23, 1985, Ser. No. 812,170
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447325
Int. Cl.[4] H01L 43/00
U.S. Cl. 338—32 R 20 Claims



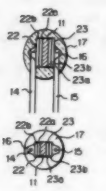
1. A position sensor comprising a first support, at least one flat, magnetic-field-dependent resistor in stripe form deposited on said support, said resistor having a longitudinal axis and ends connectable to an output voltage, and a magnetizable device which is movable relative to the magnetic-field-dependent resistor and has portions transverse to the direction of movement which exhibit alternately different space permeabilities, with the magnetic-field-dependent resistor extending parallel to and at a distance from said portions, said resistor having a uniaxial anisotropy, with the easy-axis direction being parallel to the longitudinal axis of said stripe.

4,712,084
POTENTIOMETER
Atsushi Okazaki, Iruma; Masahiko Igarashi, Mitaka, and Tsuneo Horie, Iruma, all of Japan, assignors to Copal Electronics Co., Ltd., Tokyo, Japan
Filed Mar. 19, 1986, Ser. No. 841,455
Claims priority, application Japan, Mar. 22, 1985, 60-57863; Mar. 22, 1985, 60-57868; Mar. 22, 1985, 60-57864
Int. Cl.[4] H01C 1/02
U.S. Cl. 338—184 4 Claims



1. A potentiometer in which a rotor is disposed within a chamber thereof, said potentiometer comprising:
a housing having a pair of housing side walls,
each of said housing side walls having a side wall projection extending therefrom, a pair of corner projections each of which extends from a respective end thereof, and a pair of grooves each of which extends between said side wall projection and a respective one of said corner projections; and
a case having a pair of bent legs each of which has a hole extending therethrough, and a pair of short bent walls covering the top of the housing,
said case engaging said housing in a snap-fit manner with the side wall projections of the respective housing side walls extending through the holes and the bent legs of the case extending in the pairs of grooves of the respective housing side walls,
whereby said case and said housing may be assembled by one operation in which said case is pressed down over said housing.

4,712,085
THERMISTOR ELEMENT AND METHOD OF MANUFACTURING THE SAME
Nobuyuki Miki; Hiroshi Yamaoka, both of Tokyo, and Yoichi Tanaka, Chiba, all of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Oct. 29, 1985, Ser. No. 792,456
Claims priority, application Japan, Oct. 30, 1984, 59-228437; Oct. 30, 1984, 59-228438
Int. Cl.[4] H01C 7/10
U.S. Cl. 338—22 SD 5 Claims



1. A thermistor element comprising:

a sintered thermistor chip in wafer form with two principal opposite respective surfaces;

thin film electrodes evaporated on said principal opposite respective surfaces of the thermistor chip;

lead wires each having one end which is respectively adhered to each of the thin film electrodes with heat-resisting conductive material; and

a glass body for sealing the thermistor chip, the thin film electrodes and the adhered ends of the lead wires;

wherein each of the thin film electrodes comprises a lower layer film and an upper layer film, and the lower layer film is formed by evaporating at least one metal selected from a group consisting of W, Mo, Ti, Ta, Cu, Ag, Au, Pt and Pd, and the upper layer film is formed by at least one metal selected from a group consisting of Ag, Au, Pt and Pd, and the material for the upper layer film is different from the material for the upper layer film.

4,712,086

SUPPORT FRAME FOR RESISTOR ELEMENTS IN A HEATING FURNACE FOR GLASS SHEETS

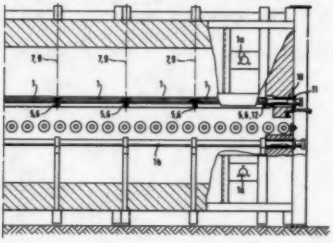
Pauli T. Reunamäki, Nattari; Erkki P. J. Yli-Vakkuri, and Kauko K. Anttonen, both of Tampere, all of Finland, assignors to O/Y Kyro A/B Tamglass, Tampere, Finland

Filed Dec. 16, 1985, Ser. No. 809,340

Claims priority, application Finland, Jan. 3, 1985, 850025

Int. Cl.⁴ F27B *9/06, 9/30*

U.S. Cl. 338—315 **9 Claims**



1. A support frame for resistor elements in a heating furnace for glass sheets, said frame being mounted in suspension and comprising a plurality of support frame elements each having an elongated rest surface and connection means for connecting each of the support frame elements to adjacent support frame elements in an articulatory end-to-end arrangement in which the articulation of the elements occurs around axes in the horizontal plane, the plurality of elongated rest surfaces being aligned to form a substantially continuous resistor element support.

4,712,087

ANALOG-TO-DIGITAL CONVERTER ERROR CORRECTION CIRCUIT

Einar O. Traa, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

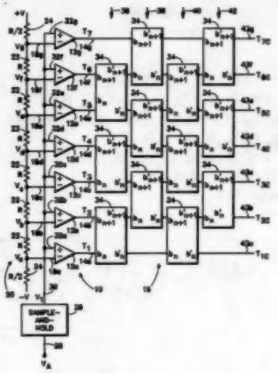
Filed Feb. 9, 1987, Ser. No. 12,752

Int. Cl.⁴ H03M *1/06*

U.S. Cl. 340—347 CC **7 Claims**

1. In a flash analog-to-digital converter having plural comparators and a reference circuit with plural DC reference signals of different amplitudes, each of the comparators having an analog signal input, a reference signal input, and a logic signal output, the analog signal inputs receiving an analog signal, each of the reference signal inputs receiving a different one of the DC reference signals, and the output signal of each comparator defining one bit of a digital thermometer code which bit is in a first logic state whenever the amplitude of the analog signal is greater than that of the DC reference signal and is in a second logic state whenever the amplitude of the analog signal is less than that of the DC reference signal, a method of determining the presence of and correcting errors in the thermometer code, comprising:

arranging the comparator outputs in an order that defines a digital thermometer code in which the outputs of comparators receiving DC reference signals of increasing amplitudes represent thermometer code bits of increasing order, the thermometer code having X number of bits in the first logic state and Y number of bits in the second logic state in response to the amplitude of the analog signal;



determining whether there is more than one transition between the first and second logic states for adjacent bits in the thermometer code, the transition for adjacent bits of lowest order defining a lowest order transition; and

upon detection of transitions other than the lowest order transition, providing a corrected digital thermometer code having X number of bits in the first logic state and Y number of bits in the second logic state but having only one transition between the first and second logic states.

4,712,088

MULTISTAGE ANGLE ENCODER WITH AN IMPROVED ALLOCATION OF COARSE CODE INFORMATION TO FINE CODE INFORMATION

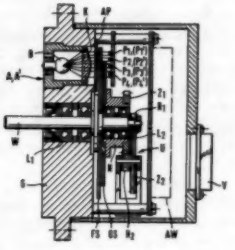
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 674,229

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342940

Int. Cl.⁴ H03M *1/26*

U.S. Cl. 340—347 P **10 Claims**



1. In a multistage angle encoder of the type comprising a drive shaft, a fine code disc coupled to the drive shaft, means for defining fine code information on the fine code disc, a gear drive coupled to the drive shaft, at least one coarse code disc

coupled to the gear drive, means for defining coarse code information on the coarse code disc, and a scanning unit defining at least one scanning axis and positioned to scan the fine and coarse code discs, the improvement comprising:

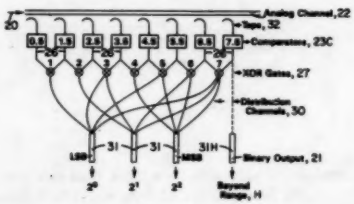
means for defining control information on the fine code disc, positioned to be superposeable over the coarse code information of the coarse code disc along the scanning axis such that the control information and the coarse code information can be directly and commonly scanned by the scanning unit, said control information adapted to allocate the coarse code information to the fine code information clearly and unambiguously.

4,712,089

ALL-OPTICAL A/D CONVERSION USING INTEGRATED NONLINEAR GUIDED WAVE OPTICAL CIRCUITRY

Carl M. Verber, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Oct. 11, 1985, Ser. No. 786,770
Int. Cl.[4] H03M 1/36
U.S. Cl. 340—347 AD 16 Claims



1. A method for receiving an analog optical input signal and for providing a digital optical output signal indicative of the intensity of the analog input signal, comprising

directing the analog optical input signal along a path comprising a series of level sensing means for determining whether the intensity of the analog input signal is above a predetermined threshold and for providing a first binary optical threshold signal of a first predetermined intensity within a first predetermined range of intensities when the intensity of the analog signal is above the threshold, and for providing a second binary optical threshold signal of a second predetermined intensity within a second predetermined range of intensities substantially separated from the first range when the intensity of the analog input signal is not above the threshold;

the first level sensing means providing a signal indicating whether the intensity of the input signal is greater than a first (lowest) designated intensity, the second level sensing means providing a signal indicating whether the intensity of the input signal is greater than a second (next to the lowest) designated intensity, the third level sensing means providing a signal indicating whether the intensity of the input signal is greater than a third (next higher, ie next to the next lowest) designated intensity, the fourth level sensing means providing a signal indicating whether the intensity of the input signal is greater than a fourth (next higher) designated intensity, and so on to the last level sensing means providing a signal indicating whether the intensity of the input signal is greater than a last (highest) designated intensity;

directing a predetermined portion of the threshold signals from the first and second level sensing means to first exclusive-or gate (XOR) means, directing a predetermined portion of the threshold signals from the second and third level sensing means to second XOR means, directing a predetermined portion of the threshold signals from the third and fourth level sensing means to third XOR means, and so on, directing a predetermined portion of the threshold signals from the next-to-last and last level sensing means to a last XOR means (in number one less than that of the last level sensing means);

each XOR means comprising means for providing a first binary optical signal (indicating inequality) of a third predetermined intensity within a third predetermined range of intensities when one of the threshold signals directed to it has the first predetermined intensity and the other threshold signal directed to it has the second predetermined intensity, and for providing a second binary optical signal (indicating equality) of a fourth predetermined intensity within a fourth predetermined range of intensities substantially separated from the third range when both of the threshold signals directed to it have the first predetermined intensity and when both of the threshold signals directed to it have the second predetermined intensity; and

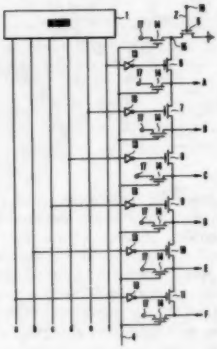
directing the digital optical signal from each XOR means to at least one of a plurality of individual optical output means according to a designated digital coding system, whereby each available combination of signals in the plurality of individual output means provides a digital indication of the specific range of optical intensities within which is the intensity of the analog optical input signal.

4,712,090

DATA CONTROL CIRCUITS

Kouichi Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 672,621
Claims priority, application Japan, Nov. 18, 1983, 58-217323
Int. Cl.[4] H03M 7/00
U.S. Cl. 340—347 DD 5 Claims



1. A circuit for encoding an output signal of a decoder which has N output signal lines, one of the N output signal lines being at a first voltage level in accordance with decoded information, the remaining output signal lines being at a second voltage level different from said first voltage level, comprising:

a first circuit having N transistors connected in series;

means for coupling an input electrode of each of said transistors to a corresponding output signal line of said decoder;

N output terminals, each of which is connected to a respective transistor of said first circuit;

means coupled to said N output terminals for charging each of the N output terminals to the first voltage level during a precharge cycle; and

a discharge means coupled to said first circuit for discharging at least one output terminal from the first voltage level to the second voltage level during a discharge cycle such that, during the discharge cycle, only the transistor coupled to the output signal line at the first voltage level is turned off while the remaining transistors are turned on, so that output terminals between the turned off transistor and said discharge means are at the second voltage level,

and the remaining output terminals are at the first voltage level.

4,712,091
DIGITAL/ANALOG CONVERTER HAVING A SWITCHABLE REFERENCE CURRENT

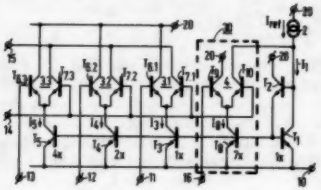
Franciscus A. C. M. Schoofs; Martinus P. M. Bierhoff; Job F. P. Van Mil, and Albert H. Slomp, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,237

Claims priority, application Netherlands, Jan. 16, 1985, 8500086

Int. Cl.⁴ H03M *1/70*

U.S. Cl. 340—347 DA **9 Claims**



1. A digital-to-analog converter for converting a digital input code into an analog output current, comprising:

a reference-current source for supplying a reference current,

a reference transistor coupled to the reference current source,

a plurality of first current source transistors coupled to the reference transistor so that the respective collector-emitter currents thereof are each in a given ratio to the collector-emitter current in the reference transistor,

a plurality of first switching devices equal in number to and individually coupled to the plurality of first current-source transistors so that the switching devices each switch a current from an associated current-source transistor to a summing point at which the analog output current is obtained, or to a point of constant potential, depending on the digital input code applied to respective switching inputs of the switching devices, and

a control device which controls the collector-emitter current in the reference transistor to increase in steps from a fraction of to substantially the full reference current from the reference current source, between a first value of the digital input code corresponding to the minimum analog output current, and a second value of the digital input code corresponding to the maximum analog output current.

4,712,092
PARALLEL ENCODED PIEZOELECTRIC KEYBOARD SWITCH AND ARRAY

Austin Boldridge, Jr., Freehold, N.J.; Scott Buell, Harpers Ferry, W. Va., and James M. Graham, Westminster, Md., assignors to Aaron J. Gellman and Samuel H. Levinson, both of Glencoe, Ill.

Filed Dec. 20, 1983, Ser. No. 563,525

Int. Cl.⁴ G06F *3/02*

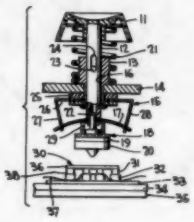
U.S. Cl. 340—365 A **25 Claims**

19. In an electrical keyboard assembly of the type wherein individual keyboard switches in an array are selectively actuable to apply an n-bit binary number in parallel on n respective common data lines, a processing circuit for processing said n-bit binary numbers comprising:

n resettable latch means, each connected to a respective data line to receive signals appearing on that line and provide a data signal representing the binary state of the received signals;

n clocked register means, each responsive to application of a gating signal thereto for entering therein the data signal provided by a respective latch means; and

timer means responsive to application of a trigger signal thereto for providing said gating signal after elapse of a first predetermined time interval following application of



said trigger signal, and for providing a reset signal to reset each of said latch means after elapse of a second predetermined time interval following application of said trigger signal, said second predetermined time interval being longer than said first predetermined time interval.

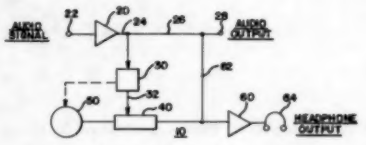
4,712,093
AUDIBLE AUDIO LEVEL INDICATOR

Kenneth R. Reichel, Hudson, and Steve Hebrock, Akron, both of Ohio, assignors to Audio Technica U.S., Inc., Stow, Ohio

Filed Apr. 10, 1986, Ser. No. 850,251

Int. Cl.⁴ G08B *3/00*

U.S. Cl. 340—540 **12 Claims**



1. A system for directly monitoring the level of an intelligence-containing electrical audio frequency signal prior to conversion to audible sound wherein an operator audibly monitors the audio frequency signal by means of a sound transducer, comprising:

threshold detection means for comparing the level of the intelligence-containing audio frequency signal to a preselected threshold level, and for generating a control signal in response to the level of the intelligence-containing audio frequency signal exceeding the preselected threshold level;

tone generating means for continuously generating an audio frequency tone signal of preselected frequency; and

gating means for coupling the audio frequency tone to the sound transducer in response to the control signal.

4,712,094
SELF-ORIENTING PASSIVE MARKER STRUCTURE

John H. Bolson, Sr., Conyers, Ga., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 29, 1986, Ser. No. 868,784

Int. Cl.⁴ G08B *13/18*

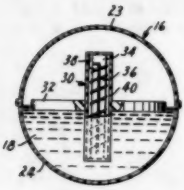
U.S. Cl. 340—572 **6 Claims**

1. A passive marker including;

an inductance-capacitance tuned circuit wherein said inductance includes a coil having an axis;

a hollow sphere partially filled with a liquid; and

a buoyant carrier carrying said tuned circuit and floating freely in said liquid for positioning said axis of said coil



closer to the vertical than the horizontal when said buoyant carrier is floating freely in said liquid.

4,712,095

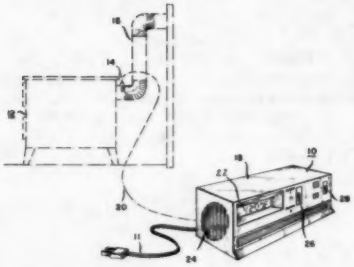
REMOTE TEMPERATURE ALARM FOR STOVES

Paul F. Georgis, II, 23 S. 11th St., Easton, Pa. 18042

Filed Aug. 1, 1986, Ser. No. 891,630

Int. Cl.[4] G08B *17/06*

U.S. Cl. 340—584 **8 Claims**



1. A remotely located temperature alarm for stoves comprising:

(a) a temperature probe for insertion into a stove pipe of said stove;

(b) electrical connection means between said temperature probe and a remotely located portion of said alarm; and,

(c) alarm means in said remotely located portion including a visual temperature display and an audible alarm means, said audible alarm means generating an audible alarm signal during the presence of either one of a "low" temperature and a "high" temperature alarm condition at said stove pipe.

4,712,096

CONDITION RESPONSIVE DETECTION SYSTEM AND METHOD

John M. Cholin, Oakland, N.J.; Jeffrey G. Cholin, Pound Ridge, N.Y., and Ray Voorhis, Midland Park, N.J., assignors to Firetek Corporation, Hawthorne, N.J.

Filed May 10, 1985, Ser. No. 732,875

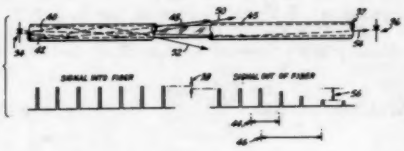
Int. Cl.[4] G08B *17/02*

U.S. Cl. 340—590 **18 Claims**

1. A condition responsive detection system for detecting the occurrence of a predetermined errant environmental condition, comprising

(a) a length of optical fiber having a first and second end, said length of optical fiber including a core and core-cladding material, said cladding material reflecting the radiant power incident thereon, said optical fiber selectively chosen to include a cladding material whose chemical structure irreversibly deteriorates upn exposure to the errant environmental condition sought to be monitored, the irreversible deterioration resulting in the otherwise incident and reflected radiant power to be lost therethrough, said optical fiber having a modal dispersion ratio (MDR) less than a predetermined number to maximize the radiant reflectively incident on said cladding material;

(b) radiant power source means for illuminating said first end; and



(c) means, disposed at the second end, for detecting the reduction in the amount of radiant power received a the second end, below a nominal level, when the chemical structure of said cladding material is irreversibly altered such that substantially all of the reflected radiant power is lost through the alteration in the cladding material.

4,712,097

AUTOMATIC MEASURING/ALARM APPARATUS FOR MEASURING RADIOACTIVE CONCENTRATION OR THE LIKE

Kazuo Hashimoto, 28-2, Komazawa 2-chome, Setagaya-ku, Tokyo, 154, Japan

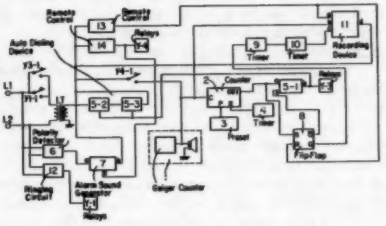
PCT No. PCT/JP84/00111, § 371 Date Nov. 2, 1984, § 102(e) Date Nov. 2, 1984, PCT Pub. No. WO84/03775, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 16, 1984, Ser. No. 674,156

Claims priority, application Japan, Mar. 18, 1983, 58-45594

Int. Cl.[4] G08B *17/12*

U.S. Cl. 379—40 **3 Claims**



1. An automatic measuring/alarm apparatus for measuring a radioactive concentration or the like, characterized by comprising:

a measuring device for expressing a change in a physical quantity such as the radioactive concentration by an audible frequency;

a preset counter for generating a count output when a number of pulse sounds from said measuring device exceeds a predetermined value;

timer means for resetting said preset counter for every predetermined time interval;

an automatic dial device for performing automatic dialing of a preset telephone number in response to the output from said preset counter;

means for forming a loop of a telephone line upon automatic dialing;

a polarity detector for inverting a polarity of the telephone line when a telephone set of a called party is taken off-hook;

means for sending an alarm sound onto the telephone line in response to an output from said polarity detector; and

a remote control circuit for detecting a remote control signal sent through the telephone line and generating an output; and

means for sending the pulse sounds received from said measuring device onto the telephone line in response to an output from said remote control circuit.

4,712,098

INERTIA SENSITIVE DEVICE

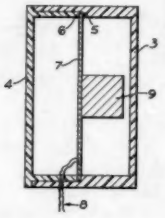
John Laing, Gillingham, England, assignor to Tapeimp Limited, North Yorkshire, England

Filed Jul. 25, 1986, Ser. No. 890,493

Claims priority, application United Kingdom, Jul. 27, 1985, 8519026

Int. Cl.[4] G08B 21/00

U.S. Cl. 340—669 **8 Claims**



1. An inertia sensitive device comprising a piezoelectric plate, a housing gripping the plate along at least a major part of the periphery of said plate, a weight supported by the plate at a position in the region of the centre of said plate, and means for detecting electrical signals generated by said plate.

4,712,099

COLOR-SIGNAL CONVERTING CIRCUIT

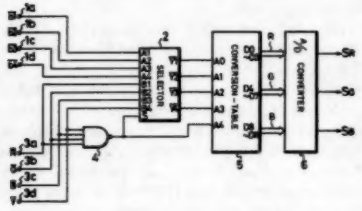
Satoru Maeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,394

Claims priority, application Japan, Jun. 13, 1983, 58-105384

Int. Cl.[4] G09G 1/28

U.S. Cl. 340—703 **16 Claims**



1. Color-signal converting apparatus for producing primary-color display signals, said apparatus comprising:

selector means receiving a first binary data signal for use with a look-up table, said first binary data signal representing a first color-signal, and a second binary data signal for use in direct display of a second color-signal, said selector means selectively supplying as outputs one or the other of said first and second binary data signals;

logic circuit means responsive to said second binary data signal for producing a logic output signal fed to said selector means to control the operation thereof, said logic output signal having a state depending on the condition of said second binary data signal; and

conversion means receiving said outputs from said selector means and receiving said logic output signal from said logic circuit means for generating said primary-color display signals from said outputs of said selector means in response to said logic output signal;

wherein said logic circuit means includes a logical NAND gate responsive to said second binary data signal for producing said logic output signal in response thereto.

4,712,100

COORDINATE INPUTTING APPARATUS USING MULTIPLE SENSORS

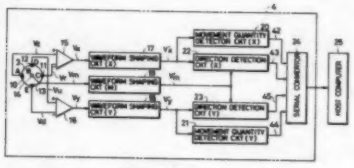
Masao Tsunekuni, and Yasuhisa Ishizawa, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1985, Ser. No. 733,390

Claims priority, application Japan, May 18, 1984, 59-98537

Int. Cl.[4] G09G 1/00

U.S. Cl. 340—710 **8 Claims**



1. A coordinate inputting apparatus comprising:

an information plate in which a plurality of patterns are provided at equal intervals in the form of a matrix, at least one said pattern having a periphery and a center and each of said patterns being symmetrical with respect to its center;

a plurality of first sensing means arranged relative to positions which are symmetrical with respect to said center of said pattern and which are substantially on said periphery of said pattern on said information plate;

second sensing means arranged relative to a postion substantially corresponding to said center of said pattern;

movement distance detecting means for detecting a movement distance in response to a change of an output from said first sensing means; and

movement direction detecting means for detecting a movement direction in response to a change of an output from said second sensing means.

4,712,101

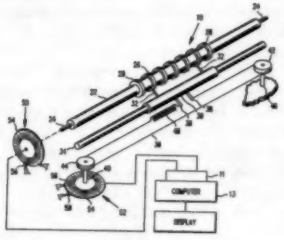
CONTROL MECHANISM FOR ELECTRONIC APPARATUS

Craig F. Culver, Woodside, Calif., assignor to Cheetah Control, Inc., Woodside, Calif.

Filed Dec. 4, 1984, Ser. No. 677,703

Int. Cl.[4] G09G 1/00

U.S. Cl. 340—710 **21 Claims**



1. A mechanism for controlling by hand the movement of a

cursor or pointer of a computer display in conjunction with a keyboard comprising:

a longitudinal rotatable shaft;

a housing for supporting said rotatable shaft;

a cylindrical member mounted coaxially around a portion of said shaft, said member being slidable axially along said shaft and rotatable about said shaft;

first and second encoding means coupled to said shaft and cylindrical member respectively for sensing rotation of said shaft and linear movement of said cylindrical member along said shaft and for generating output signals representing the magnitudes and directions of such rotation and linear movement respectively, so that the motions of said shaft and said member enable the adjustment of said output signals with a resultant change in the position of said cursor or pointer.

4,712,102

METHOD AND APPARATUS FOR DISPLAYING ENLARGED OR ENHANCED DOT MATRIX CHARACTERS

Demetrios Troupes, and Randall W. Alexander, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 695,997, Jan. 29, 1985, Pat. No. 4,586,835, which is a continuation-in-part of Ser. No. 602,248, Apr. 20, 1984, abandoned. This application Jul. 3, 1985, Ser. No. 752,176

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—790 **58 Claims**

1. A method of displaying enlarged dot matrix characters comprised of selected binary data elements representing either a dot or a blank in a matrix of positions arranged in horizontal rows and vertical columns, the method comprising

(a) storing sets of binary data elements, each set defining a respective character having horizontal linear components of a high density and vertical and diagonal linear components of a low density;

(b) performing logical operations on a set of the stored binary data elements to generate associated additional binary data elements which enlarge the size of the respective character in at least one of the vertical and horizontal directions by lengthening the diagonal linear components and the selected vertical or horizontal linear components; and

(c) selectively using the generated associated additional binary data elements together with the stored binary data elements to display characters in which the diagonal and selected vertical or horizontal linear components thereof are lengthened to display a character of enlarged size.

4,712,103

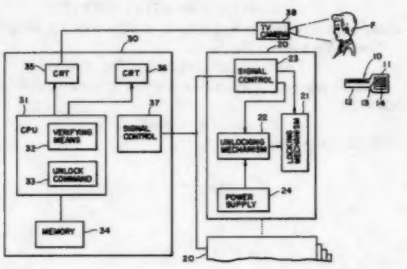
DOOR LOCK CONTROL SYSTEM

Motohiro Gotanda, 1802-10, Nakabyo, Abiko-shi, Chiba-ken, Japan

Filed Dec. 3, 1985, Ser. No. 804,083

Int. Cl.[4] G06F *7/04*; G07D *7/00*; G06K *9/00*

U.S. Cl. 340—825.31 **3 Claims**



1. A door lock control system comprising:

door lock means having a keyhole;

plurality of keys owned by respective predetermined key owners, assigned with respective predetermined key numbers, each adapted for insertion into the keyhole and each having a memory storing information of the owner's face as video data and information of the key number;

information storage means storing information of a predetermined portion of the video data stored in the memory of each of said keys and correlated to each key number;

processing means adapted for being electrically coupled to the memory of said key inserted into the keyhole and for reading out

(A) the information of the key owner's face stored in the memory of said key inserted into the keyhole,

(B) the information of the key number stored in the memory of said key inserted into the keyhole,

(C) selected one of the information of the predetermined portions of the video data stored in the information storage means according to the information (B) of the key number, and

(D) information of the predetermined portion of the video data stored in the memory of said key inserted into the keyhole;

the predetermined portion of the video data being video signals of a predetermined scan line of the video data;

verifying means coupled to the processing means to verify whether or not the information (C) read out from the information storage means by the processing means corresponds to the information (D) read out from the memory of the key by the processing means;

first display means coupled to the processing means for displaying said key owner's face according to the information (A) read out by the processing means;

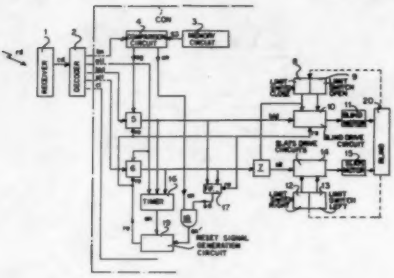
a television camera disposed outside of the door for taking the face image of the person who has inserted said key into the keyhole; and

second display means coupled to said television camera for displaying the face image of said person taken by said television camera, to permit comparison of the displayed face images of said first and second display means, and determination whether or not said person inserting the key is the same as the predetermined owner of said key and, from the verifying means a determination whether or not the key inserted into the keyhole is one of those owned by the predetermined key owners.

4,712,104
REMOTE CONTROL BLIND SYSTEM

Masahiko Kobayashi, Nagaoka, Japan, assignor to Kuron Kabushiki Kaisha, Niigata, Japan

Filed Apr. 19, 1985, Ser. No. 724,998
Int. Cl.[4] H04Q *7/00*; G08C *19/00*; E05F *11/00*
U.S. Cl. 340—825.52 **8 Claims**



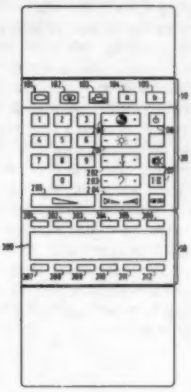
1. A remote control blind system comprising:
a plurality of blinds which can be freely opened and closed;
a plurality of control units provided for each of said blinds, for independently opening and closing each of said blinds;
receiving means for receiving and processing radio signals and for transmitting said signals to said control units; and
transmitting means provided separately from said receiving means, for transmitting said radio signals;
each of said control units at least comprising:
means for storing a blind number to specify said blind;
means for comparing a signal of said stored blind number with a designation signal of the blind number that was received and processed, from said radio signal and for transmitting an agreement signal of the blind number when said signals agree;
a holding type open/close gate which is set by said agreement signal and which transmits an operation signal of the blind to a drive means for opening and closing the blind;
a retriggerable timer which is triggered by the blind operation signal and which transmits a stop signal of the blind operation when said timer is not retriggered for a predetermined period of time; and
reset signal generating means which resets the holding type open/close gate when the stop signal of the blind operation is transmitted.

4,712,105
REMOTE CONTROL HAND APPARATUS FOR OPERATING DIFFERENT MODULES

Hans E. P. Köhler, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1985, Ser. No. 729,008
Claims priority, application Netherlands, Mar. 12, 1985, 8500690
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.69 **5 Claims**

1. A remote control hand apparatus for generating control signals for controlling several functions of a plurality of modules coupled to the hand apparatus via a transmission channel, said hand apparatus comprising, a plurality of multi-functional keys to which one of a plurality of control functions is selectively assignable and of which the control function operable thereby is dependent on the module to be operated; a plurality of module keys each of which is assigned to a module; display means; a control circuit coupled to said module keys and to said multi-functional keys, said control circuit selecting, in dependence on the module to be operated, one of the assignable control functions for assigning a specific function to the multi-functional key and for displaying said operating function on the display means, characterized in that a user can only gain access to a relevant module via said plurality of module keys and the control circuit; that the display means comprise one single display device of the dot-matrix type around which all of the multi-functional keys are arranged in registry with adjacent portions of the display device assigned to respective ones

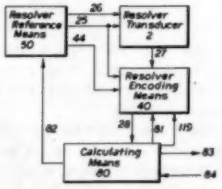


of the multi-functional keys and on which display device a plurality of symbols indicating the actual control functions associated with the module selected to be operated and assigned to the multi-functional keys are simultaneously displayed for all of the specific control functions assigned to their respective adjacent multi-functional keys upon actuation of a particular module key and under the control of the control circuit.

4,712,106
PHASE ANALOG ENCODING SYSTEM WITH COMPENSATION

Paul F. McNally, Gibsonia, Pa., assignor to International Cybernetics Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 827,475, Feb. 5, 1986, abandoned, which is a continuation of Ser. No. 560,658, Dec. 12, 1983, abandoned. This application Nov. 20, 1986, Ser. No. 933,301
Int. Cl.[4] G08C *19/06, 15/06*; G01C *25/00*
U.S. Cl. 340—870.32 **19 Claims**



1. A resolver based phase analog encoding system for indicating position with compensation for an inherent electrical phase shift across said resolver comprising:
(a) a resolver transducer;
(b) a resolver reference means electrically connected to said resolver transducer for generating and applying a plurality of reference signals to said resolver transducer;
(c) a resolver encoding means electrically connected to said resolver transducer and said resolver reference means for measuring a sum ($\phi+\alpha$) of a mechanical displacement ϕ and an inherent electrical phase shift across said resolver transducer α, or an inherent electrical phase shift across said resolver transducer α independent of the mechanical

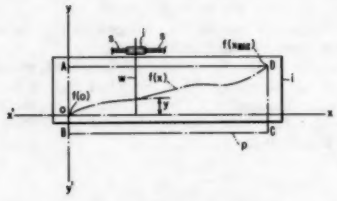
displacement ϕ, or an inherent electrical phase shift due to said encoding means γ; and

(d) a calculating means electrically connected to said resolver encoding means and said resolver reference means for compensating said measured sum $(\phi+\alpha)$ by said measured inherent electrical phase shift α to obtain a value of said mechanical displacement ϕ, said calculating means also compensating for said inherent electrical phase shift due to said encoding means γ, said calculating means controlling said resolver reference means and said resolver encoding means so that said sum $(\phi+\alpha)$, said inherent electrical phase shift across said resolver transducer α, and said inherent electrical phase shift due to said encoding means γ are measured in a time multiplexed manner; and wherein the calculating means, when the system is to measure the inherent electrical phase shift α sends a feedback signal to the resolver reference means to activate a reference switch in the resolver reference means thereby applying the correct reference signal in the correct orientation to the resolver transducer to compensate for the current value of the mechanical displacement ϕ thereby ensuring that the measurement of the inherent electrical phase shift α will be valid independent of the mechanical displacement ϕ of the resolver.

4,712,107
CAPACITIVE DISPLACEMENT TRANSDUCER FOR GENERATING ELECTRICAL SIGNALS CORRESPONDING TO SINGLE-VALUED FUNCTIONS

Armik A. Hakhverdian, 1153 Janis Way, San Jose, Calif. 95125

Filed Feb. 4, 1985, Ser. No. 697,839
Int. Cl.⁴ G01R *27/26*
U.S. Cl. 340—870.37 **9 Claims**



1. An apparatus for converting a single-valued elementary function $f_1(x_1)$ into a corresponding electrical signal at any point x_1 within a predetermined interval in which the function $f_1(x_1)$ is defined, comprising:

a function-plate having one edge corresponding to a graph of said function $f_1(x_1)$, said plate being rigidly mounted on a moveable carriage arranged so as to be moveable in a direction parallel to the abscissa of said graph of said function $f_1(x_1)$;

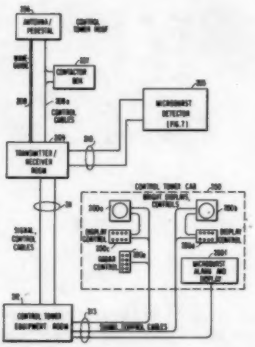
a fixedly mounted thin conductive probe arranged adjacent said one edge of said plate, said probe being electrically insulated from and spaced parallel to said plate arranged perpendicular to the direction of movement of said plate;

a capacitance measuring device connected to said probe for converting the measured electrical capacitance between said probe and said plate into an electrical signal output; wherein said measured capacitance between said probe and said plate at any one point x_1 within said interval is proportional to the value of said graph at said one point x_1 and wherein said electrical signal output thereby corresponds to the value of said function $f_1(x_1)$ at said point x_1.

4,712,108
METHOD AND APPARATUS FOR DETECTING MICROBURSTS

Carl Schwab, Huntington Station, N.Y., assignor to ISC Cardion Electronics, Inc., Woodbury, N.Y.

Filed Oct. 21, 1985, Ser. No. 789,971
Int. Cl.⁴ G01S *13/95*
U.S. Cl. 342—26 **17 Claims**



1. A microburst detector comprising a doppler radar detector propagating electromagnetic energy along a propagation path sweeping in range and azimuth across a region in space including at least one end of an airport runway, and an intelligent processor responsive to signals from said doppler radar,

said intelligent processor including storage means for storing a representation of an array of cells located in rows and columns storing data representative of wind velocity components parallel to said propagation path, said intelligent processor performing a pattern matching function for searching for a specific pattern of data within said cells of the array for locating a center of a particular circle wherein data of equal and opposite signs are stored in a pair of cells located along one diameter of the particular circle and null or near null data are stored at another pair of cells along a perpendicular diameter of said particular circle, and

means for signalling a microburst on detection of said pattern.

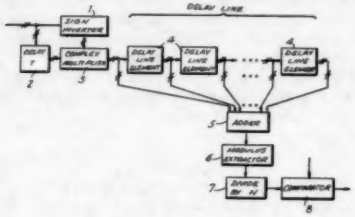
4,712,109
DEVICE FOR THE IDENTIFICATION OF UNDESIRABLE ECHOES IN RADAR SYSTEMS

Gaspare Galati, and Mario Orsini, both of Rome, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

PCT No. PCT/IT85/00019, § 371 Date May 27, 1986, § 102(e) Date May 27, 1986, PCT Pub. No. WO86/00999, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 24, 1985, Ser. No. 860,345
Claims priority, application Italy, Jul. 27, 1984, 48645 A/84
Int. Cl.⁴ G01S *7/66*
U.S. Cl. 342—159 **3 Claims**

1. A device for the detection of a plurality of different types of undesirable echoes in radar systems, said device comprising means for detecting the presence of undesirable echoes having a large azimuth correlation coefficient and echoes having a small correlation coefficient and means for discriminating said detected large azimuth correlation coefficient echoes against said detected small correlation coefficient echoes comprising an element which changes the sign of the quadrature component of the vector of the complex signal at input 1; an element introducing delay T which resets in time the input present to that present during the previous sweep, 2; a complex multiplier 3 which multiplies the outputs of blocks 1 and 2; a tapped delay

line, 4, with elementary delay; an adder, 5, of the N outputs from delay line 4: a modulus extractor, 6, of adder output 5; a divide by N, 7 of the modulus extractor output; a comparator,



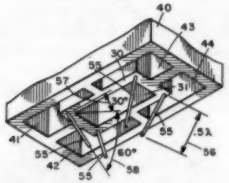
8, which by comparing the divide by N output with a settable threshold, generates a binary indication related to clutter detection.

4,712,110

FIVE-PORT MONOPULSE ANTENNA FEED STRUCTURE WITH ONE DEDICATED TRANSMIT PORT

John T. Branigan, Claremont, and David J. Vess, Los Angeles, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Dec. 26, 1985, Ser. No. 813,365
Int. Cl.[4] H01Q *1/52, 13/02*
U.S. Cl. 343—779 **13 Claims**



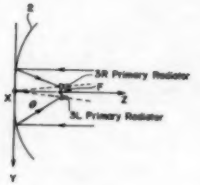
1. An antenna feed structure, which comprises:
a single transmit horn for transmitting signals to a reflective surface;
an array of four receive horns arranged symmetrically about the transmit horn for receiving energy directed from the reflective surface;
feed means for feeding power to be transmitted to the central transmit horn only;
collecting means for collecting power received at the four receive horns only; and
decoupling means for decoupling the receive horns from the transmit horn, the decoupling means comprising phase-shift means for inducing a phase shift in energy emanating from the transmit horn toward the receive horns, the phase shift means including a plurality of isolation pins attached about the periphery of the transmit horn and inclined towards one another.

4,712,111

ANTENNA SYSTEM

Tomozo Ohta, Ikoma; Kazutada Higashi, and Hirohiko Yamamoto, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 26, 1985, Ser. No. 813,535
Claims priority, application Japan, Dec. 26, 1984, 59-277657; Mar. 15, 1985, 60-52804
Int. Cl.[4] H01Q *19/17*
U.S. Cl. 343—779 **13 Claims**



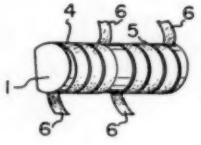
1. An antenna system comprising:
a segmented parabolic reflector offset from an axis of symmetry comprising one of the three mutually perpendicular axes;
a primary radiator for a clockwise circularly polarized wave;
a primary radiator for a counterclockwise circularly polarized wave,
said reflector reflecting clockwise and counterclockwise circular polarizations in reflection paths having different directions,
said primary radiators for clockwise and counterclockwise circularly polarized waves being fixed at two different positions relative to said parabolic reflector, and
said reflector reflecting clockwise and counterclockwise circularly polarized waves radiated from said respective primary radiators in respectively different directions.

4,712,112

MINIATURE ANTENNA WITH SEPARATE SEQUENTIALLY WOUND WINDINGS

Francis Carr, Kanata, Canada, assignor to Siltronics Ltd., Ontario, Canada

Filed Aug. 7, 1985, Ser. No. 763,465
Claims priority, application Canada, Aug. 14, 1984, 461015
Int. Cl.[4] H01Q *7/08, 1/36*
U.S. Cl. 343—788 **22 Claims**



1. An antenna comprising a plurality of sequentially wound separate conductive windings on a magnetic core, each winding being connected in series with a corresponding capacitor to form a plurality of series circuits, the series circuits being connected in parallel with each other in parallel aiding direction.

4,712,113

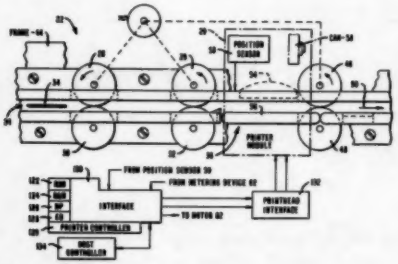
THERMAL TRANSFER RIBBON MECHANISM AND RECORDING METHOD

Ralf M. Brooks, Waterloo; Brian P. Connell, Elmira; Dennis T. Sonnenburg, Waterloo, and Stefan J. Pagowski, Kitchener, all of Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Jul. 17, 1986, Ser. No. 886,488

Int. Cl.[4] G01D *15/10;* **B41J** *33/34;* **G11B** *15/32*

U.S. Cl. 346—1.1 **17 Claims**



16. A method of thermal recording employing a thermal transfer ribbon carrying ink material which is transferred to a document by thermal means, comprising the following steps:

(a) advancing the ribbon a predetermined amount in a recording direction by a stepping motor during each recording operation to provide a fresh ribbon for the transferral of ink to a document to be recorded upon;

(b) sensing and measuring the number of steps of the stepping motor required for movement of the ribbon a given distance in said recording direction; and

(c) reversing the ribbon by a predetermined amount during each recording cycle by operation of the stepping motor in a reverse direction a number of steps determined by utilizing the number of steps taken by the stepping motor for movement of the ribbon a given distance in said recording direction, to provide ribbon slack for the prevention of document smudging and ribbon breakage.

4,712,114

LABEL FEEDING APPARATUS FOR A THERMAL LABEL PRINTER

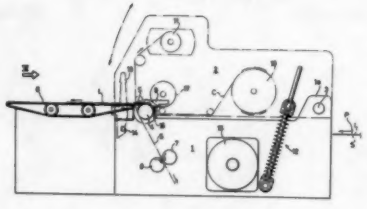
Hidenori Kikuchi, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Sep. 26, 1986, Ser. No. 912,794

Claims priority, application Japan, Sep. 28, 1985, 60-213668

Int. Cl.[4] G01D *15/10;* **B65C** *9/18;* **B41J** *3/20;* **B65H** *43/04*

U.S. Cl. 346—76 PH **13 Claims**



1. A thermal label printer comprising:

a print head for printing data on labels and means for conveying an elongated backing sheet supporting the labels which are detachably adhered to the backing sheet past the print head;

a peeling member located past the print head along a travel direction of the backing sheet, the peeling member having a configuration which causes the labels to peel off the backing sheet when the travelling direction of the backing sheet changes sharply as the backing sheet travels past the peeling member; and

conveyor belt means extending to the peeling member for carrying printed labels out of the thermal printer, the conveyor belt means including means for adjusting the position of the conveyor belt means relative to the peeling member to create a clearance which facilitates loading and insertion of the backing sheet between the peeling member and the conveyor belt means.

4,712,115

THERMAL-TRANSFER PRINTER

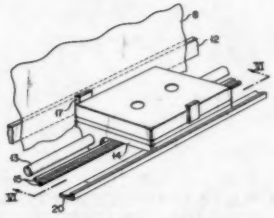
Hisao Tatsumi; Haruhiko Kayata; Kenji Yamamori, all of Nagoya; Toshio Kakizawa, Kuwana, and Toshiaki Mogi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 5, 1986, Ser. No. 860,008

Claims priority, application Japan, May 10, 1985, 60-100325; May 10, 1985, 60-100326; May 22, 1985, 60-110024

Int. Cl.[4] G01D *15/10;* **B41J** *3/20*

U.S. Cl. 346—76 PH **13 Claims**



1. A thermal-transfer printer for printing input information on a record medium by using a ribbon cassette which includes a pair of reels and a repeatedly usable ink ribbon wound on the reels, comprising:

thermal head means arranged for reciprocation along the record medium, for, during both advancing and returning strokes, heating the ink ribbon to thermally transfer ink of the ribbon to the record medium in accordance with the input information, thereby printing lines alternately in advancing and returning directions;

ribbon transport means for rotating the reels to transport the ink ribbon in a desired direction; and

control means for supplying a transport control signal to said ribbon transport means to transport the ink ribbon in a predetermined direction so that the ink ribbon does not move relatively to the record medium during the printing by the thermal head, and for supplying a take-up control signal to said ribbon transport means so that so that the starting end side of the ribbon is taken up for a predetermined length every time one line or a few lines are printed.

4,712,116

MEANS AND METHOD OF SYMMETRICAL ENERGIZATION OF INDIVIDUAL ARRAY LED'S FOR IMAGE EXPOSURE

Hans Reinten, Velden, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Dec. 23, 1985, Ser. No. 812,175

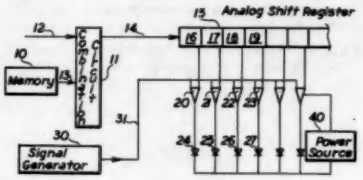
Claims priority, application Netherlands, Dec. 24, 1984, 8403926

Int. Cl.[4] G01D *9/42, 9/00;* **H04N** *1/21*

U.S. Cl. 346—107 R **7 Claims**

2. In an exposure device for exposing a movable lightsensitive layer comprising a straight array of individual LED's for

line-wise exposure of said light-sensitive layer, said array extending perpendicularly to the direction of movement of said light-sensitive layer; and means for energizing for a variable time each individual LED in said array for each image line,



wherein said time variation corresponds to corrected image signals, the improvement comprising a circuit means for energizing each individual LED is said array symmetrically with respect to an imaginary line extending parallel to said array for each image line.

4,712,117

ADJUSTING APPARATUS FOR LASER SCANNING SYSTEM WITH ACOUSTO-OPTICAL ELEMENT

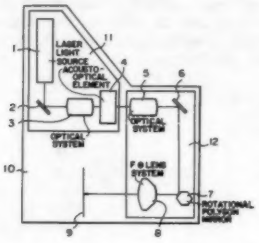
Fumiaki Kawaguchi, Tokyo; Toshikazu Shimazu, and Kazuhisa Takahashi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,583

Claims priority, application Japan, Nov. 15, 1984, 59-241426

Int. Cl.[4] G01D *9/42*

U.S. Cl. 346—108 **5 Claims**



1. A laser recording appartus having:
a laser light source;
an acousto-optical element for optically modulating the laser beam from said laser light source;
a beam expander;
a scanning optical system for optically scanning a diffracted light emerging from aid acousto-optical element toward a recording surface;
an f θ lens system for imaging the light passed through said scanning optical system on the recording surface;
a frist plate on which said laser light source and said acousto-optical element are disposed as a first unit; and
a second plate on which said beam expander, said scanning optical system and said f θ lens system are disposed as a second unit, the relative position of said second plate and said first plate being adjustable.

4,712,118

LASER BEAM PRINTER

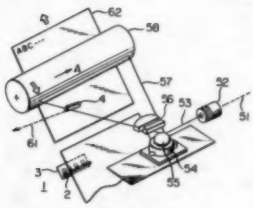
Kaoru Seto, Chigasaki; Yukihide Ushio, Higashi; Kenjiro Hori, Yokohama; Hiroshi Hashimoto; Toshio Yoshimoto, both of Tokyo, and Kiyoshi Kanaiwa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 897,818

Claims priority, application Japan, Aug. 26, 1985, 60-185912; Jan. 22, 1986, 61-10010; Jan. 22, 1986, 61-10013; Jan. 22, 1986, 61-10014

Int. Cl.[4] G01D *9/42, 15/14*

U.S. Cl. 346—108 **14 Claims**



1. A laser beam printer comprising:
a recording medium for forming an image;
scanning means for scanning a beam modulated by an image signal on said recording medium; and
means for detecting the position of said beam scanned by said scanning means;
wherein said detecting means outputs a plurality of synchro signals for defining the record start position on said recording medium.

4,712,119

RECORDING APPARATUS HAVING PLURAL ADJUSTABLE RECORDING HEADS

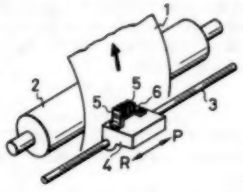
Takehiko Kiyohara, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1985, Ser. No. 797,522

Claims priority, application Japan, Nov. 19, 1984, 59-244046; Nov. 19, 1984, 59-244047

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **8 Claims**



1. A recording apparatus comprising:
a platen for recording;
a carriage movable along said platen;
a plurality of recording heads, each having a mounting surface and a projecting portion projected from said mounting surface;
a head mounting member disposed on said carriage to mount thereon said plurality of recording heads, said head mounting member having a supporting surface contacting said mounting surface and a plurality of openings into each of which a corresponding said projecting portion tightly fits;
a plurality of head supporting members for pressing respec-

tive said recording heads against a side surface of said corresponding opening; and

adjusting means for adjusting the distance and the angular orientation of said head mounting member with respect to said platen.

4,712,120

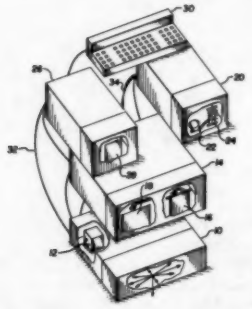
LASER MATERIALS TREATMENT SYSTEM

William Latto, Kissimee, Fla., assignor to C-E Industrial Lasers, Incorporated, Somerville, Mass.

Filed Mar. 17, 1986, Ser. No. 840,500

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—145 **1 Claim**



1. A modular laser materials marker assembly comprising:

a. a plurality of separate, modularized units including a first unit comprising a laser head and delivery optics assembly unit, a second unit comprising a power supply unit, a third unit comprising a cooling unit, a fourth unit comprising a microprocessor unit, and a fifth unit comprising a keyboard and display unit, each of said units being relatively positionable with respect to the others of said units whereby the spatial configuration of said assembly may be arranged in various ways;

b. removable fluid conveying means for interconnecting the laser head and delivery optics assembly unit; and

c. removable electrical connecting means for electrically connecting the power supply unit to the laser head and delivery optics assembly unit, the power supply unit to the cooling unit, the power supply unit to the microprocessor unit, the microprocessor unit to the keyboard and display unit, and the microprocessor unit to the laser head and delivery optics assembly unit.

4,712,121

HIGH-SPEED SEMICONDUCTOR DEVICE

Naoki Yokoyama, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1985, Ser. No. 754,416

Claims priority, application Japan, Aug. 30, 1984, 59-179178

Int. Cl.[4] H01L *27/12, 29/161, 29/72*

U.S. Cl. 357—4 **12 Claims**

1. A high-speed semiconductor device, comprising:

an emitter layer having a conduction band with a first energy level;

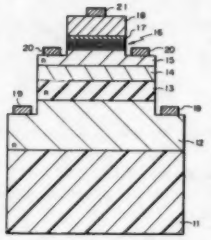
a base layer formed under said emitter layer and having a conduction band with a second energy level;

superlattice means, disposed between said emitter layer and said base layer, carriers tunneling therethrough, said superlattice means comprising:

a first potential barrier layer forming a heterojunction with said emitter layer and having a conduction band with a third energy level, said third energy level being higher than said first energy level so that the conduction band of said emitter layer and the conduction band of said first potential barrier layer have a discontinuity therebetween;

a quantum well layer forming a heterojunction with said first potential barrier layer and having a fourth conduction band with a fourth energy level, said fourth energy level being lower than said third energy level; and

a second barrier layer forming a heterojunction with said quantum well layer and said base layer and having a conduction band with a fifth energy level, said fifth energy



level being higher than said fourth and second energy levels;

said first and second barrier layers having a thin thickness for tunneling carriers therethrough, and said quantum well layer having a thin thickness so as to have a sub-band therein;

a collector semiconductor layer formed under said base layer; and

a collector side potential-barrier means disposed between said base layer and said collector semiconductor layer.

4,712,122

HETEROJUNCTION GATE BALLISTIC JFET WITH CHANNEL THINNER THAN DEBYE LENGTH

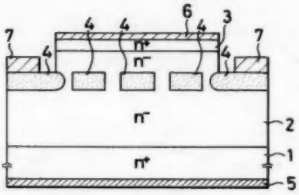
Junichi Nishizawa, 6-16, Komegafukuro 1-chome, and Kaoru Motoya, 1-9-406, Komegafukuro 2-chome, both of Sendai-shi, Miyagi-ken, Japan, assignors to Research Development Corp.; Junichi Nishizawa and Kaoru Motoya, all of, Japan

Filed Jul. 25, 1985, Ser. No. 759,090

Claims priority, application Japan, Jul. 26, 1984, 59-153969; Jul. 26, 1984, 59-153972

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **5 Claims**



1. A static induction transistor of thermionic emission type comprising a channel region made of a semiconductor and having first and second sides, a source region and a drain region having a high impurity concentration and each formed in contact with a respective side of said channel region, and a gate region making contact with at least part of said channel region, the gate region being formed of a semiconductor having a forbidden band gap larger than that of the semiconductor forming said channel region, the distance from said source region to the gate region being selected to be smaller than the mean free path of carriers, and the gap of said channel region being selected to be smaller than $2\lambda_D$, where λ_D is the Debye

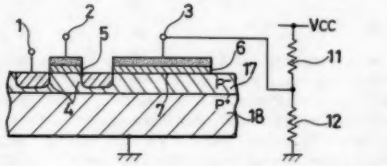
length determined by the impurity concentration of said channel region.

4,712,123

DYNAMIC MEMORY DEVICE

Hideshi Miyatake; Kazuyasu Fujishima, both of Itami; Tsutomu Yoshihara, Amagasaki; Masaki Kumanoya; Hideto Hidaka, both of Itami, and Katsumi Dosaka, Nishinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,023
Claims priority, application Japan, Aug. 31, 1984, 59-183074
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.6 **3 Claims**



1. A dynamic MOS memory device including a plurality of memory cells of the 1-transistor, 1-capacitor type, each memory cell comprising:

a semiconductor substrate;

an epitaxial active layer formed on said substrate;

a plurality of diffusion layers formed in said epitaxial layer at an area corresponding to a MOS transistor;

an oxide film formed over said epitaxial layer except at locations where said diffusion layers are formed;

a word line electrode formed on said oxide film at said area corresponding to a MOS transistor; and

a cell plate electrode formed on said oxide film at an area corresponding to a MOS capacitance,

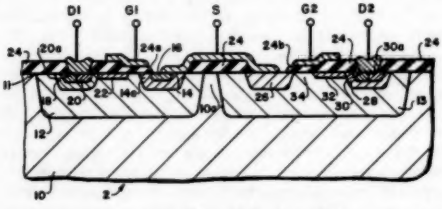
a half value of a writing voltage being applied to said cell plate electrode, and a constant voltage being applied to said substrate.

4,712,124

COMPLEMENTARY LATERAL INSULATED GATE RECTIFIERS WITH MATCHED "ON" RESISTANCES

Edward H. Stupp, Spring Valley, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,420
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 **2 Claims**



1. A complementary Lateral Insulated Gate Rectifier (LIGR), which comprises:

a semiconductor substrate of a first conductivity type and having a major surface;

first and second adjacent surface-adjoining semiconductor wells of a second conductivity type opposite to that of said first type in said substrate and separated from each other by a portion of said substrate;

a first surface-adjoining semiconductor region of the first conductivity type in said first well and a shallower, surface-adjoining first source region of the second conductivity type in said first semiconductor region;

a first surface-adjoining drain region of the second conductivity type in said first well and a second, shallower surface-adjoining drain region of the first conductivity type in said first drain region;

a first surface-adjoining drain extension region of the first conductivity type in said first well and extending from said first drain region toward said first semiconductor region;

an insulating layer on said major surface and having a first insulating layer portion over said first well and covering at least a portion of said first semiconductor region between said first source region and said first drain region;

a first gate electrode on said first insulating layer portion, over at least said portion of the first semiconductor region, and insulated from said substrate;

a second surface-adjoining source region of the first conductivity type in said second wall;

a third surface-adjoining drain region of the first conductivity type in said second well and a fourth, shallower surface-adjoining drain region of the second conductivity type in said third drain region;

a second surface-adjoining drain extension region of the first conductivity type in said second well and extending from said third drain region toward said second source region;

a second insulating layer portion of said insulating layer on said major surface over said second well and covering at least a portion of said second well between said second source region and said second drain extension region;

a second gate electrode on said second insulating layer portion, over at least said portion of said second well, and insulated from said substrate;

first and second drain electrodes connected, respectively, to said second and fourth drain regions; and

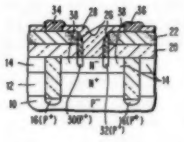
a source electrode connected to said first semiconductor region, said first source region and said second source region.

4,712,125

STRUCTURE FOR CONTACTING A NARROW WIDTH PN JUNCTION REGION

Harsaran S. Bhatia; Satyapal S. Bhatia, both of Wappingers Falls; Jacob Riseman, Poughkeepsie, and Emmanuel A. Valsamakis, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 405,844, Aug. 6, 1982, Pat. No. 4,507,171.
This application Oct. 18, 1984, Ser. No. 661,999
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.[4] H01L *29/04*
U.S. Cl. 357—59 **24 Claims**



1. An integrated circuit structure comprising:

a semiconductor body having surface regions thereof isolated from other such regions by a pattern of isolation;

a narrow width PN junction region within at least one of said surface regions having a width dimension substantially that of its electrical contact;

a substantially vertical conformal conductive layer of submi-

cron thickness in said electrical contact to said PN junction region;

a substantially horizontal conductive layer in electrical contact with an upper vertical edge portion of said vertical conductive layer and separated from said surface regions by a first electrical insulating layer, said horizontal conductive layer being substantially thicker than said vertical conductive layer;

a second electrical insulating layer over said horizontal conductive layer; and

an electrical contact to said horizontal conductive layer through an opening in said second electrical insulating layer which effectively makes electrical contact to said narrow width PN junction region through said horizontal conductive layer and said vertical conductive layer.

4,712,126

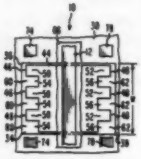
LOW RESISTANCE TUNNEL

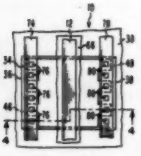
Francis R. Slattery, Lower Providence Township, Montgomery County, Pa., assignor to RCA Corporation, Somerville, N.J.

Filed Mar. 17, 1986, Ser. No. 839,954

Int. Cl.[4] H01L *29/46, 23/50, 29/04, 29/44*

U.S. Cl. 357—71 **6 Claims**





1. A low resistance conductor for interconnecting two points on opposite sides of an intervening conductor comprising:

(a) a first layer of doped silicon having a first edge and a second edge spaced from said first edge;

(b) a second layer of doped silicon having a third edge and a fourth edge spaced from said third edge, said second layer being disposed directly over said first layer;

(c) a first metal conductor in ohmic contact with said first layer adjacent said first edge and said second layer adjacent said third edge; and

(d) a second metal conductor in ohmic contact with said first layer adjacent said second edge and said second layer adjacent said fourth edge, said first and second metal conductors being disposed on opposite sides of said intervening conductor wherein said second layer includes, along said third edge and along said fourth edge, (1) a plurality of openings through which said first and second metal conductors extend to be in said ohmic contact with, respectively, said first and second edges of said first layer, and (2) an area of contact to the adjacent metal conductor, each area being disposed between each pair of said openings.

4,712,127

HIGH RELIABILITY METAL AND RESIN CONTAINER FOR A SEMICONDUCTOR DEVICE

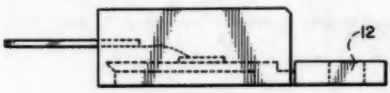
Piero Colombo, Monza; Marino Cellai, Bresso, and Carlo Cognetti de Martiis, Milan, all of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milan, Italy

Filed Nov. 29, 1983, Ser. No. 556,159

Claims priority, application Italy, Dec. 1, 1982, 24533 A/82

Int. Cl.[4] H01L *23/12*

U.S. Cl. 357—72 **4 Claims**



1. A container for a semiconductor device comprising a metal plate and a body of synthetic resin which encapsulates part of said plate so as to keep a surface of said plate exposed, said plate being arranged such that an area of said plate has two opposed side notches and at least one groove connecting said two notches together and said body of synthetic resin projects into said two opposed side notches and said at least one groove without projecting beyond said two opposed side notches.

4,712,128

SEMICONDUCTOR DEVICES HAVING CONTACT ARRANGEMENT

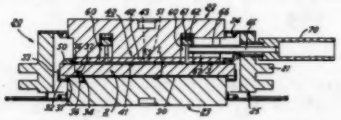
Roger F. C. Bennett, Melksham, United Kingdom, assignor to Westinghouse Brake and Signal Co., Ltd., Chippenham, United Kingdom

Filed Jul. 15, 1985, Ser. No. 755,249

Claims priority, application United Kingdom, Jul. 24, 1984, 8418823

Int. Cl.[4] H01L *23/42, 29/74, 23/48*

U.S. Cl. 357—79 **17 Claims**



1. A semi-conductor device comprising a semiconductor element positioned in a housing having on a first of two opposing major faces concentric outer and inner annuli of a first region of conductivity and positioned therebetween an annulus of a second region of conductivity, a disk shaped electrical connector sandwiched between that surface of the semiconductor element defining the first region of conductivity and a contact member that forms a part the housing of the device, the disk shaped electrical connector and the contact member both formed to extend out over an outer peripheral area of that surface of the semiconductor element radially outward of the concentric outer annuli of the first region of conductivity, both the disk shaped electrical connector and the contact member are supported to inhibit rotational and radial movement with respect to the semi-conductor element, the disk shaped electrical connector being formed with apertures therethrough which apertures are aligned with the annulus of the second region of conductivity, a plurality of electrically interconnected electrical connections supported in said housing adjacent the contact member to extend outward through the apertures of the disk-shaped electrical connectors, a resilient means which is located between each of the electrically interconnected electrical connections and the contact member for resiliently urging the electrically interconnected electrical connections through the apertures and into engagement with

the annulus of the second region, a means for electrically insulating the resilient means from the contact member, and an electrical contact extending externally of the housing which is electrically connected to the electrically interconnected electrical connections, and wherein the plurality of the electrically interconnected electrical connections are formed from an electrically conductive tubular member which has a plurality of circumferentially separated slots formed to extend through said tubular member from an open end with the externally extending electrical contact being electrically connected to the tubular member.

4,712,129

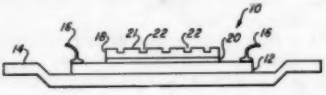
INTEGRATED CIRCUIT DEVICE WITH TEXTURED BAR COVER

John W. Orcutt, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 560,765, Dec. 12, 1983, abandoned. This application Sep. 30, 1985, Ser. No. 781,175

Int. Cl.[4] H01L *23/28, 25/04, 23/02*

U.S. Cl. 357—84 **16 Claims**



1. An integrated circuit device comprising:

support means;

a semiconductor bar affixed to said support means;

adhesive means for providing an adhesive layer; and

a rigid planar member having a smooth surface, and a textured surface for locking to an encapsulating medium with the smooth surface being affixed to a surface of said bar opposite said support means by the adhesive layer, the adhesive layer being dispersed between the smooth surface and the surface of said bar.

4,712,130

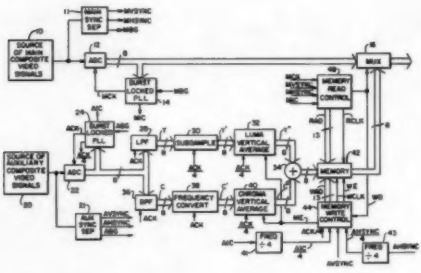
CHROMINANCE SIGNAL FREQUENCY CONVERTER AS FOR A PIX-IN-PIX TELEVISION RECEIVER

Robert F. Casey, Oradell, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 29, 1986, Ser. No. 901,631

Int. Cl.[4] H04N *5/265*

U.S. Cl. 358—22 **6 Claims**



1. A video signal processing system comprising:

an input terminal for applying a sampled data signal representing a chrominance signal which includes a baseband color information signal modulating a subcarrier signal having a predetermined frequency, wherein the sampling frequency of said sampled data signal is substantially equal to N times said predetermined frequency, where N is a real number not less than two;

sample interpolating means, coupled to said input terminal for interpolating between a plurality of selected pairs of samples of said sampled data signal to develop a plurality of interpolated samples; and

means, coupled to said sample interpolating means, for selecting samples from among said interpolated samples and the samples of said sampled data signal to develop a further sampled data signal representing said color information signal modulating a further subcarrier signal having a frequency that is less than said predetermined frequency.

4,712,131

SYNC APPARATUS FOR IMAGE MULTIPLEX TRANSMISSION SYSTEM

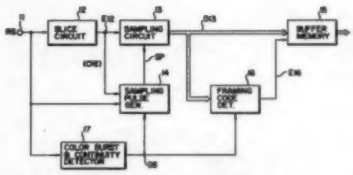
Toshiyuki Tanabe, Ageo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 17, 1986, Ser. No. 886,553

Claims priority, application Japan, Jul. 19, 1985, 60-159341

Int. Cl.[4] H04N *7/08, 7/087, 7/093*

U.S. Cl. 358—142 **11 Claims**



1. A sync apparatus for an image multiplex transmission system, comprising:

image information fetch means, responsive to a data packet contained in a transmission signal, for extracting the data packet from the transmission signal and fetching the contents of the data packet;

fetch phase determination means, coupled to said image information fetch means, for determining first phase data which defines the timing of fetching the contents of each said data packet, said fetching being performed in accordance with an actual phase of each said data packet by said image information fetch means;

continuity detection means, responsive to a specific signal component (color burst, data packet, etc.) of said transmission signal, for detecting the continuity of said specific signal component to provide a continuity detection signal; and

fetch phase exchange means, coupled to said fetch phase determination means and to said continuity detection means, for exchanging said first phase data with second phase data when said continuity detection signal is provided, said second phase data being prefixed and free of said first phase data.

4,712,132

DEVICE AND METHOD FOR REDUCING THE AMPLITUDE RANGE OF SIGNALS REPRESENTING AN IMAGE

Serge Soca, Ile Saint Louis, France, assignor to Thomson Video Equipment, Gennevilliers, France

Filed Jan. 8, 1986, Ser. No. 817,260

Claims priority, application France, Jan. 8, 1985, 85 00182

Int. Cl.[4] H04N *9/68*

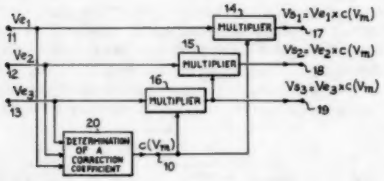
U.S. Cl. 358—37 **42 Claims**

1. A device for reducing the amplitude range of a plurality of input signals representing an image, comprising:

means for determining at each instant a correction signal whose instantaneous value is a predetermined non-linear

function of the present input signal having the highest value at that instant; and

means for applying the correction signal to each of the input signals so as to generate a second, like-numbered plurality



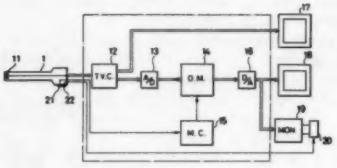
of output signals, the output signals having reduced amplitude ranges relative to the input signals, but the ratios among the respective output signals equalling the ratios among corresponding input signals.

4,712,133

ENDOSCOPIC APPARATUS

Katsuya Kikuchi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 2, 1986, Ser. No. 914,664
Claims priority, application Japan, Oct. 3, 1985, 60-219075
Int. Cl.[4] A61B *1/04*
U.S. Cl. 358—98 **16 Claims**



1. An endoscopic apparatus, comprising:

(a) an image pickup optical system;

(b) a solid state image pickup element for converting an optical image of an object formed by said optical system to electrical signals;

(c) a television circuit unit for converting the output signal from said solid state image pickup element to a video signal;

(d) memory means for memorizing the video signal from said television circuit unit;

(e) means for supplying a freeze command signal to display the video signal under frozen condition;

(f) display means for displaying a real image and/or a frozen image; and

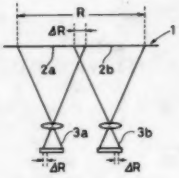
(g) a memory controller for controlling writing and reading for said memory means to display both of the real image and the frozen image on said display means when a freeze command signal is supplied from said freeze command signal supply means, and to display the real image alone when no freeze command signal is supplied, whereby the real image is displayed in said display means all the time irrespective of the presence or absence of the freeze command signal.

4,712,134

IMAGE READER WITH PLURAL PICKUP ELEMENTS READING OVERLAPPING IMAGE REGIONS OF AN ORIGINAL IMAGE

Shigeo Murakami, Fushimi, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 21, 1986, Ser. No. 865,985
Claims priority, application Japan, May 31, 1985, 60-119348
Int. Cl.[4] H04N *3/14, 1/415*
U.S. Cl. 358—213.13 **6 Claims**



1. An image reader for reading image data of the original, said image reader comprising:

a plurality of image pickup elements for reading said image data of said original, said elements reading partially overlapping image regions to provide image pickup signals;

density change detecting means for detecting a pixel array having small spatial density changes with respect to that of adjacent pixels from among pixels located within an overlapping image region on the basis of said image pickup signals supplied from said image pickup elements and specifying the detected pixel as a switching pixel; and

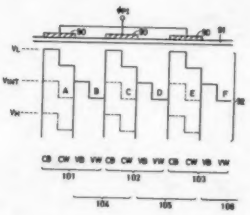
image pickup signal connecting means for connecting respective said image pickup signals supplied from said plurality of image pickup elements at said switching pixel and outputting the connected image signals to desired image processing system.

4,712,135

IMAGE PICKUP APPARATUS

Seiji Hashimoto, Yokohama; Takao Kinoshita, and Nobuyoshi Tanaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 873,067, Jun. 4, 1986, abandoned, which is a continuation of Ser. No. 560,836, Dec. 13, 1983, abandoned. This application Oct. 17, 1986, Ser. No. 922,812
Claims priority, application Japan, Dec. 22, 1982, 57-225628
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.22 **34 Claims**



1. An image pickup apparatus comprising:

(a) a radiation receiving section including a plurality of picture elements adapted to receive radiation from an object;

(b) at least one electode for controlling a potential in each picture element; and

(c) control means having a first mode in that said electrode

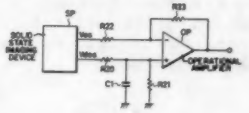
is controlled so as to respectively form one potential well in each picture element for charge accumulation, and a second mode in that said electrode is controlled so as to respectively form a plurality of potential wells in each of said picture elements for charge accumulation.

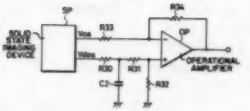
4,712,136

SIGNAL PROCESSING CIRCUIT OF SOLID STATE IMAGE PICKUP DEVICE

Tokuichi Tsunekawa, Yokohama, and Yuichi Sato, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1986, Ser. No. 906,273
Claims priority, application Japan, Sep. 12, 1985, 60-202437
Int. Cl.[4] H04N *5/335*
U.S. Cl. 358—213.15 **15 Claims**





1. A signal processing circuit of a solid state image pickup device having a signal voltage output circuit for outputting a charge signal as voltage information through a charge voltage converter and a correction voltage output circuit for generating a reference voltage into which no signal charge is input and which has a circuit arrangement similar to said signal voltage output circuit,

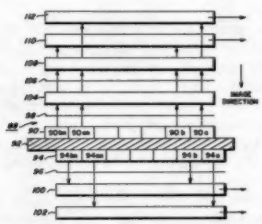
wherein an output of said correction voltage output circuit is provided with a time constant circuit, and said signal processing circuit has a circuit for differentially amplifying a correction voltage output which is derived through said time constant circuit and an output of said signal voltage output circuit.

4,712,137

HIGH DENSITY CCD IMAGER

Narayan K. Kadekodi, Torrance; Abd-El-Fattah A. Ibrahim, Palos Verdes Estates; Roland J. Handy, Northridge, all of Calif., and Jagdish C. Tandon, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 285,250
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.29 **10 Claims**



1. A high density charge coupled device imaging array (88) on a single integrated circuit chip, wherein the improvement is characterized by:

a first row (90) of photosites deposited on said integrated circuit chip, said photosites being sensitive to applied light information,

a second row (94) of photosites deposited on said integrated circuit chip parallel to but separated from said first row (90) of photosites, said second row (94) of photosites being offset from said first row of photosites approximately one-half the length of the individual photosites in said first row such that said second row of photosites are sensitive to applied light information intermediate the phototsites in said first row of photosites, said first and second rows of photosites comprising a bilinear array of said photosites,

shield or opaque means between said first (90) and second (94) rows of photosites to shield said imaging array from any said applied light in the area defined by said shield or opaque means,

a first storage register (104) deposited on said integrated circuit chip adjacent to said first row (90) of photosites to receive and store the bits of light information detected by said first row of photosites (90) and converted to electronic charge information,

a second storage register (108) deposited on said integrated circuit chip adjacent to said first storage register (104) to receive and store said bits of light information received and stored by said first storage register (104),

a third storage register (110) deposited on said integrated circuit chip adjacent to said second storage register (108) to receive and store alternate bits of said light information received and stored by said second storage register (108),

a fourth storage register (112) deposited on said integrated circuit chip adjacent to said third storage register (110) to receive and store the remaining bits of said light information received and stored by said second storage register,

a fifth storage register (100) deposited on said integrated circuit chip adjacent to said second row (94) of photosites to receive and store alternate intermediate bits of light information detected by said second row (94) of photosites converted to electronic charge information, and

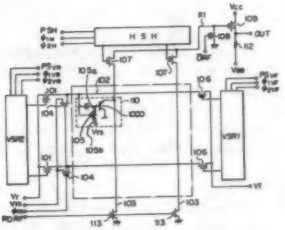
a sixth storage register (102) deposited on said integrated circuit chip adjacent to said fifth storage register (100) to receive and store the remaining intermediate bits of said light information detected by said second row (94) of photosites converted to electronic charge information.

4,712,138

LOW-NOISE APPARATUS FOR IMAGE PICKUP AND COMBINATION OF LIGHT AND ELECTRIC SIGNALS

Kenji Kyuma, Kawasaki, and Teruo Hieda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,484
Claims priority, application Japan, Dec. 28, 1984, 59-276977
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.31 **18 Claims**



1. An image pickup apparatus comprising:

(a) an image pickup element including a plurality of ar-

ranged non-destructively readable photoelectric conversion elements; and

(b) input means for inputting electric charges to each of said photoelectric conversion elements, said input means including an input member selectively connected to a variable electrical signal source and conversion means for inputting electric charges corresponding to said variable electrical signal to each of said photoelectric conversion elements.

4,712,139
IMAGE COMMUNICATION APPARATUS

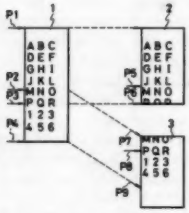
Yoshiaki Kato, Kurume, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,305

Claims priority, application Japan, Oct. 28, 1983, 58-200752; Oct. 28, 1983, 58-200753; Jan. 25, 1984, 59-010337

Int. Cl.⁴ H04N *1/32*

U.S. Cl. 358—257 **12 Claims**



1. An image communication apparatus comprising:

reading means for reading an image on an original for conversion to electrical signals;

transmission means for transmitting the image data read by said reading means;

first discrimination means for discriminating a shape of a recording member on a reception side;

second discrimination means for discriminating, in the case that a recording member on the reception side is a cut-sheet-like recording member, whether or not the single original image can be recorded on the single cut-sheet-like recording member; and

control means, responsive to a discrimination result of said second discrimination means, for controlling said apparatus such that the single original image is divided to be recorded on a plurality of such cut-sheet-like recording member and in the divisional recording the original image is recorded with paritial overlapping.

4,712,140
IMAGE REDUCTION METHOD

Frederick C. Mintzer, Shrub Oak, and Karen L. Anderson, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 567,310, Dec. 30, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 840,627

Int. Cl.⁴ H04N *7/18*

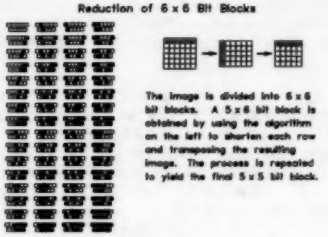
U.S. Cl. 358—260 **20 Claims**

1. A method for reducing the size of a binary image in a general-purpose computer comprising the steps of:

storing said binary image in bit sequence in said computer

dividing said image into transposable blocks of n×i bits

transposing for each block, each string of n bits along a first axis to a string of m bits along a second axis where m is less than n;


Reduction of 6 x 6 Bit Blocks
The image is divided into 6 x 6 bit blocks. A 5 x 6 bit block is obtained by using the algorithm on the left to shorten each row and transposing the resulting image. The process is repeated to yield the final 5 x 5 bit block.

transposing for each transposed block, each string of i bits along said first axis to a string of j bits along said second axis, where j is less than or equal to i; and

storing said transposed blocks.

4,712,141
METHOD AND APPARATUS FOR INTERPOLATING IMAGE SIGNALS

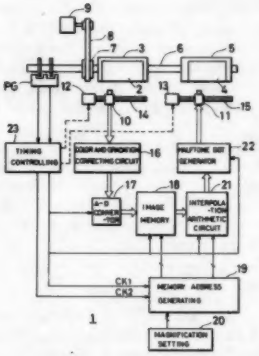
Kunio Tomohisa; Masamichi Cho, and Yasuo Kurusu, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 20, 1986, Ser. No. 841,466

Claims priority, application Japan, Mar. 30, 1985, 60-67865; Mar. 30, 1985, 60-67867

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—280 **13 Claims**



1. An apparatus for interpolating image signals, comprising:

memory means for storing data on at least two adjacent pixels of an input image;

interpolation data generating means for interpolating between said two pixels to generate at least one interpolation data;

timing control means for controlling output timings so that said image data on said two adjacent pixels and said generated interpolation data are outputted in a mode ordered in accordance with an array of pixels of an output image;

a one-dimensional photoelectric conversion element array device for photoelectrically scanning an original, input resolution by said one-dimensional photoelectric conversion element array device being set to be lower than output resolution; and

an A-D converter for converting input image signals from said one-dimensional photoelectric conversion element array device into digital image data, wherein

said memory means includes a first memory means for stor-

ing a pair of image data adjacent in the main scanning direction and a second memory means for storing image data on a pair of scanning lines adjacent in the vertical scanning direction, and

said interpolation data generating means includes a first interpolation data generating means for generating interpolation data for said image data stored in said first memory means and a second interpolation data generating means for generating interpolation data for said image data stored in said second memory means,

said first memory means storing image data from said A-D converter and said second memory means storing said image data stored in said first memory means and said interpolation data generated by said first interpolation data generating means in compliance with said order by said timing control means.

4,712,142

IMAGE PICKUP APPARATUS WITH RANGE SPECIFICATION OF DISPLAYED IMAGE

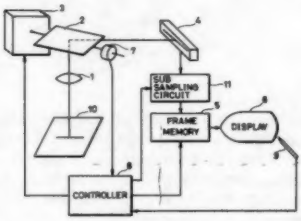
Satoru Tomita, and Mitsunori Adachi, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1986, Ser. No. 884,295

Claims priority, application Japan, Aug. 27, 1985, 60-190738; Aug. 27, 1985, 60-190739

Int. Cl.[4] H04N 1/10

U.S. Cl. 358—285 **6 Claims**



1. An image pickup apparatus for acquiring an image of an object, said image pickup apparatus comprising:

a rotary scanning mirror stepwisely rotated to scan said object;

driving means for driving said rotary scanning mirror;

an image sensor for sensing said image on said object scanned by said rotary scanning mirror;

detecting means for detecting rotation angles of said rotary scanning mirror;

frame memory means for storing picture signals outputted from said image sensor in addresses corresponding to said rotation angles detected by said detecting means;

position indicating means for specifying a scanned range on said object; and

control means for supplying rotation angles of said rotary scanning mirror to said driving means so that said rotary scanning mirror scans said specified scanned range on the basis of a position indicating signal for specifying said scanned range specified by said position indicating means while varying the step size of said rotary scanning mirror thereby to vary resolution.

4,712,143

APPARATUS FOR MONITORING A TIMEBASE COMPRESSED COLOR VIDEO SIGNAL

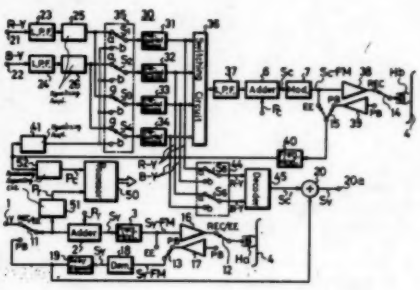
Hiroshi Kawakami, Tokyo, and Kazuo Ishizaka, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,984

Claims priority, application Japan, Jun. 14, 1984, 59-122701

Int. Cl.[4] H04N 9/79

U.S. Cl. 358—311 **5 Claims**



1. A video tape recorder of the kind that records a color video signal in which a luminance signal and a chrominance signal are recorded on separate channels in combination with a timebase circuit wherein at least two chrominance component signals are compressed in timebase and alternately arranged in turn to be recorded on one track as said chrominance signal, for monitoring in an edit mode a compressed chrominance signal prior to recording the latter comprising:

a control signal processor receiving said color video signal and producing video display control signals therefrom;

the timebase circuit including timebase compressing and expanding means having first and second inputs receiving at said first inputs said chrominance component signals and control signals from said control signal processor for inputting therein to said chrominance component signals in response to a first control signal from said control signal processor and for outputting said chrominance component signals in response to a second control signal from said control signal processor with a frequency that is an integral number of times higher than that of said first control signal to thereby produce in a recording mode timebase compressed chrominance component signals; and

coupling means for use in the edit mode for supplying said chrominance component signals, which are derived from an output of said timebase compressing and expanding means under control of said second control signal, to said second inputs of said timebase compressing and expanding means whereby said timebase compressed chrominance component signals are input in said timebase compressing and expanding means by said second control signal,

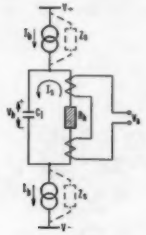
wherein when succeeding chrominance component signals are input into said timebase compressing and expanding means at said second inputs by said second control signal, said timebase compressed chrominance component signals that are re-input in said timebase compressing and expanding means are output therefrom by said first control signal so as to produce normal timebase chrominance component signals for monitoring in the edit mode.

4,712,144

METHOD AND APPARATUS FOR READING RECORDED DATA BY A MAGNETORESISTIVE HEAD

Klaas B. Klaassen, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1985, Ser. No. 767,549
Int. Cl.[4] G11B *5/02, 5/127*
U.S. Cl. 360—67 **10 Claims**



1. A method for detecting magnetic fields having encoded information, comprising the steps of:

(a) exposing a magnetoresistive element to the magnetic fields; and

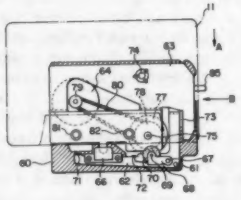
(b) directly sensing the ratio of the instantaneous value of change in the resistance of the magnetoresistive element to the total resistance of the magnetoresistive element.

4,712,145

OPERATING MECHANISM FOR SMALL PORTABLE CASSETTE TAPE PLAYER

Toshimasa Naruki, Fukushima, and Toshihisa Goto, Tokyo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 705,933, Feb. 26, 1985, abandoned. This application Jul. 16, 1986, Ser. No. 886,124
Claims priority, application Japan, Mar. 1, 1984, 59-28223[U]; Mar. 1, 1984, 59-28224[U]; Mar. 1, 1984, 59-28225[U]; Mar. 1, 1984, 59-28226[U]; Mar. 1, 1984, 59-28227[U]
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.5 **3 Claims**



1. An operating mechanism for a portable cassette tape player, comprising:

receiving means for receiving a cassette, including a first movable substrate on which at least a reproducing head of said cassette tape player is mounted;

guiding means for guiding said cassette to a loaded position by pushing said cassette towards a front end of said portable cassette tape player in which an opening for exposing a magnetic tape is formed, said guiding means including a second movable substrate; and

holding means for selectively holding said cassette at said loaded position and releasing said cassette from said loaded position wherein:

when a rear end of said cassette is pushed a first time, said cassette is guided to and held at said loaded position by said guiding means and said holding means, respectively, said second movable substrate being moved toward said first movable substrate, and said portable cassette tape player is placed in a signal reproducing state, and

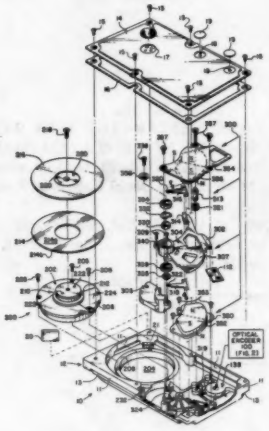
when said rear end of said cassette is pushed a second time, said cassette is released from said loaded position and is shifted to a nonloaded position, said second movable substrate being moved away from said first movable substrate and said portable cassette tape player is placed in a stop state, and wherein said holding means operates in a push-push manner without operating buttons for initiating and terminating a playing operation.

4,712,146

THIN AND COMPACT MICRO-WINCHESTER HEAD AND DISK ASSEMBLY

William G. Moon, Sunnyvale; Donald C. Westwood, Cupertino, and Thomas R. Stone, Pleasanton, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Filed Jun. 4, 1985, Ser. No. 741,178
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—97 **13 Claims**



1. A compact, sealed head and disk assembly for a rotating non-removable disk data storage subsystem comprising:

a flat and thin rigid generally rectangular box housing for aligning, mounting and substantially enclosing the elements providing said head and disk assembly without protrusions extending therefrom;

a thin spindle motor mounted in a well formed in a floor of said housing and having a spindle rotatable at a predetermined angular velocity;

at least one magnetic media data storage disk in said housing and mounted directly to said spindle for rotation;

a limited angular displacement rotary actuator subassembly journalled to a post extending from the floor in said housing adjacent to the magnetic media data storage disk and including:

a rotary actuator motor located oppositely away from the data storage disk and comprising:

a coil,

a first flux return plate mounted to said housing,

a first permanently magnetized flux-providing flat plate magnet mounted adjacent to and within the locus of movement of said coil, said first magnet having a plurality of magnetic pole regions at a major surface thereof facing said coil, said first magnet being mounted to said first flux return plate so that said plate returns the flux between pole regions of said first magnet at a surface facing said first plate,

a second flux return plate mounted to said housing in

alignment with and spaced away from said first flux return plate and first magnet,

a second permanently magnetized flux-providing flat plate magnet mounted adjacent to and within the locus of movement of said coil, and having a major surface facing the major surface of said first magnet across a gap slightly greater than the thickness of said coil and having a plurality of magnetic pole regions on said major surface complementary with the oppositely facing poles of said first magnet,

said coil being freely moveable along its locus of limited displacement in said gap and having windings disposed to cut the flux of said regions,

whereby said first and second magnets provide a magnetic flux field in said gap the lines of which are cut by the coil and said flux return plates contain said flux to the vicinity of said gap and prevent said flux from reaching said data storage disk; and,

a unitary planar frame journalled to the post fixed in said housing and rotatable in alignment with the plane of said data storage disk, said frame comprising:

a hub for containing a plurality of bearing means for providing a rotatable journal with said post,

a first region extending from the hub oppositely away from the data storage disk for supporting said coil of said rotary actuator motor,

a second region extending from the hub for supporting a data transducer arm carrying a data read and write transducer in close proximity to concentric data tracks formed on said disk surface, there being a single transducer for each data surface of said data storage disk, and

a third region carrying a counterweight for countering any imbalances presented by the presence of said first and second regions, thereby presenting a constant torque load to said rotary actuator motor irrespective of orientation of said head and disk assembly, the counterweight disposed in part in vertical interlaid arrangement with respect to said data storage disk; and

a cover for closing and sealing said housing.

4,712,147

TAPE TRANSPORT CYLINDER WITH STRESS-RELIEVED BEARING RECESS

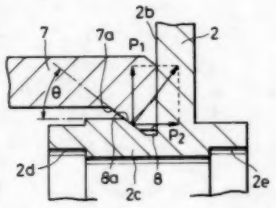
Kiyoshi Chikashige, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,520

Claims priority, application Japan, Mar. 16, 1983, 58-42095; Mar. 17, 1983, 58-43048

Int. Cl.[4] G11B *15/60*

U.S. Cl. 360—130.24 **4 Claims**



1. In a magnetic tape guiding cylinder device including: an upper cylinder adapted to receive a magnetic tape at the periphery of the cylinder, and a fixed lower cylindrical assembly, the improvement in said lower cylindrical assembly wherein it includes an outer cylindrical shell connected by a radially extending wall to an inner cylindrical tubular portion projecting axially from said radially extending wall and being coaxial with said outer cylindrical shell, said inner cylindrical tubular portion being provided with at least a first bearing recess on the interior thereof; a bearing disposed in said recess, said bearing closely fitting along substantially its entire periphery in the bearing recess; a drive shaft in said cylindrical tubular portion axially attached at one end to said upper cylinder for imparting a rotary motion thereto and rotatably supported at least by said bearing, said tubular portion having a chuck engagement groove disposed along the outer circumference of said cylindrical tubular portion and between said radially extending wall and first bearing recess at the end of said tubular portion, said groove being configured to be engageable with inwardly movable jaws of a machining holding chuck, the ends of which also engage said radially extending wall so that, upon inward pressure created by entry of said jaws into said groove, said jaws also a but said radially extending wall to produce a holding force having a radial component applied against said tubular portion and an axial component against said radially extending wall to distribute the clamping forces in both radial and axial directions to mitigate substantial distortion of said tubular portion.

4,712,148

MAGNETIC TAPE CASSETTE WITH EQUALIZATION OF ELECTROSTATIC CHARGES

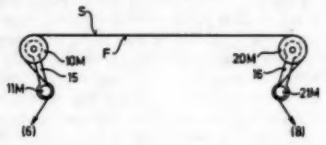
Werner Balz, Limburgerhof; Wulf Muenzner, Frankenthal; Klaus D. Schomann, Ludwigshafen; Heinz Berger, Kehl, and Roland Roos, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 411,606, Aug. 25, 1982. This application Jul. 3, 1986, Ser. No. 881,855

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 8125650[U]; Dec. 23, 1981, 8137551[U]

Int. Cl.[4] G11B *23/08, 15/60*

U.S. Cl. 360—132 **3 Claims**



1. A magnetic tape cassette, particularly video tape cassette, having a substantially rectangular housing of plastic material comprising front side along which the scanning of the tape takes place and, in said housing, two tape reels and two sets of guide means for guiding the tape from one of said tape reels via one of said sets of guide means, over a path parallel to the front of said housing, and via the other set of guide means onto the other reel, said tape having a magnetic layer (front) face and an electrically insulating plastics film (back) face, and each of said sets of guide means including a deflecting element adjacent the respective front corner of said housing, said deflecting elements contacting the back face of the tape, and each also including a guide element contacting the front face of the tape, said deflecting elements and the guide element of at least one of said sets being at least partially of electrically conductive material, and said housing also including a connector element or connector elements electrically connecting at least said one guide element with at least the associated deflecting element, so as to equalize electrostatic charges between the two faces of the tape by way of said connector element(s) and thus counteract sticking of the tape to said deflecting elements due to electrostatic attraction therebetween and counteract the build-up of electrostatic charges along the tape path parallel to the front of the housing due to the transporting of such charges from the deflecting elements as a reuslt of the tape travel.

4,712,149
RECORDING TAPE CASSETTE

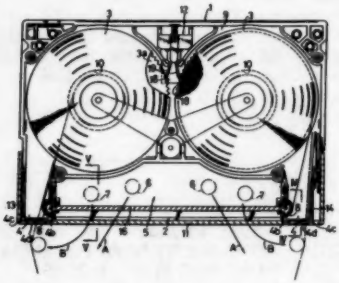
Shinichi Goto, Kyoto, and Kenji Ogiro, Yokohama, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka and Hitachi, Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 553,070, Nov. 18, 1983, abandoned. This application Aug. 29, 1986, Ser. No. 902,113

Claims priority, application Japan, Nov. 20, 1982, 57-175777[U]

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—132 **4 Claims**



1. A recording tape cassette comprising a top section and bottom section having a recording tape wound on a pair of tape reels and a pair of tape drawing openings each of which is defined at a front left end and a front right end of a front portion of the tape cassette by top front walls, bottom front walls, and a pair of generally vertical side walls, said recording tape being drawn out of said tape cassette from one of said tape drawing openings and returned to the tape cassette passed through a second tape drawing opening, said recording tape cassette comprising within each of said defined tape drawing openings inner vertical guide walls projecting from said bottom front wall, a top end thereof contacting a lower surface of said top front walls, each of said inner vertical walls having a hollow semi-cylindrical surface along a front end portion thereof for guiding said recording tape in a vertical attitude, a front edge of each of said top front walls being set back from a frontmost portion of said cylindrical surfaces where said lower surfaces of said top walls contact said top ends of said vertical guide walls thereby providing added support to said guide walls preventing bending thereof under force applied by said recording tape, said set back feature preventing damage to said tape if displaced in an upward direction.

4,712,150
TAPE CASSETTE HAVING A LOCK MECHANISM FOR LOCKING A TAPE PROTECTIVE LID

Albert Pertzack, Munich; Ludwig Zeroni, Ottobrunn, and Hubert Brunner, Weil, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,531

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504965

Int. Cl.[4] G11B *23/087*

U.S. Cl. 360—132 **4 Claims**

1. In a cassette for a magnetic video tape, the combination of a two part housing with

an upper housing,

a lower housing,

said upper and lower housings each having a front wall formed with apertures and side walls,

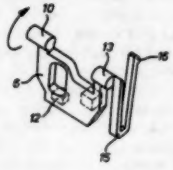
a front panel pivotally mounted on the side walls so constructed and arranged as to have an open position and a closed position with respect to the apertures,

side parts of the front panel partly overlapping the side walls

a locking plate mounted on a inner wall of the lower housing half,

a journal bearing on said locking plate rotatably supported in recesses in said inner wall of the lower housing half providing means for hinging said locking plate on the axis of rotation of said journal bearing so constructed and arranged that the plate is positioned inside the front part of the side walls and the side parts of the front panel,

spring means mounted on the inside of the side part of said front panel under torque and engaging the front panel so



constructed and arranged to tend to move the front panel from closed to open position,

means on the plate for engaging the front panel so constructed and arranged as to close the panel over the apertures and to be disengageable upon hinging of the plate,

a U-shaped spring integral with said journal bearing having an arm with a free end positionable on and engageable with the upper housing half so constructed and arranged as to apply a force to the journal bearing tending to produce an angular moment in the plate and engage the plate with the front panel.

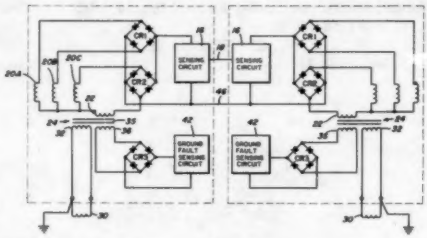
4,712,151
SYSTEM FOR DETECTION OF GROUND FAULTS IN CIRCUIT BREAKERS

Robert F. Dvorak, Mount Vernon, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Apr. 5, 1985, Ser. No. 720,195

Int. Cl.[4] H02H *3/16*

U.S. Cl. 361—47 **11 Claims**



1. An electric circuit breaker connected to an electrical system having three phase conductors and a neutral conductor, said circuit breaker giving an indication upon the occurrence of a ground fault, said circuit breaker comprising:

a first terminal connected to each of the phase conductors;

a second terminal connected to each of the phase conductors;

a current path between each respective pair of said first terminals and said second terminals, each of said current paths including a pair of separable contacts;

three phase current transformers, each separately magnetically coupled to one of said phase conductors, each said phase current transformer having a secondary winding

producing a current proportional to the current through its related phase conductor;

a neutral current transformer magnetically coupled to the neutral conductor, the neutral current transformer having a secondary winding producing a current proportional to the current through the neutral conductor, said neutral current transformer secondary winding beng electrically connected to circuit ground, and said secondary winding of said neutral current transformer being electrically isolated from the secondary windings of said phase current transformers; and

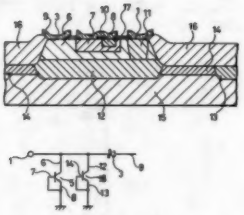
a ground fault summing transformer having a first primary winding and a second primary winding electrically isolated from one another, the sum of the currents produced by the phase current transformers being applied tc said first primary winding by connecting the secondary windings of said phase current transformers to said first primary winding, and the current produced by the neutral current transformer being applied only to said second primary winding, said summing transformer having a secondary winding producing a signal indicating the occurrence of a ground fault when the sum of the currents received through said phase current transformers and said neutral current transformer does not equal zero.

4,712,152

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Masaya Iio, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,048
Claims priority, application Japan, Dec. 12, 1985, 60-280092
Int. Cl.[4] H02H *9/00*; H01L *27/04*
U.S. Cl. 361—56 **3 Claims**



1. A semiconductor integrated circuit device comprising:

at least two NPN transistors whose bases and emitters are connected to the ground and whose collectors are connected to an input terminal;

one of said NPN transistors having a lower breakdown starting voltage and a higher breakdown maintaining voltage than those of the other of said NPN transistors; and

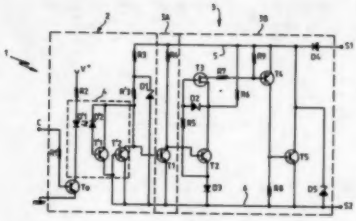
an input portion which has a breakdown maintaining voltage at a high surge voltage breakdown which occurs due to an application of a high surge voltage input to said input terminal which is lower than that at a low input voltage breakdown which occurs due to an application of a low surge voltage or an input voltage which rises up gradually.

4,712,153

POWER CIRCUIT AND TRIGGER DEVICE COMPRISING SAME

Christian Marget, Verneuil-en-Halatte, and Gérard Rose, Villers St Paul, both of France, assignors to Charbonnages de France, Paris, France

Filed Sep. 3, 1985, Ser. No. 771,680
Claims priority, application France, Sep. 3, 1984, 84 13571
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **20 Claims**



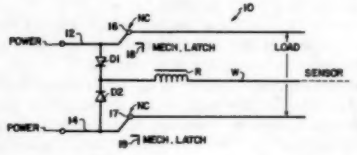
1. Power circuit comprising a main circuit having a current amplifier circuit connected between a minimum potential line and a maximum potential line, a protection circuit connected between said minimum potential line and said maximum potential line and in series with said current amplifier circuit, said protection circuit having a control terminal, and a trigger and distributor circuit connected in parallel with said main circuit and said protection circuit adapted to neutralize said protection circuit via its control terminal when the voltage across said main circuit is below a threshold value and to activate said protection circuit when said voltage across said main circuit reaches said threshold value whilst maintaining said voltage across said main circuit at a substantially constant ratio to the voltage between said minimum and maximum potential lines.

4,712,154

SHOCK PROTECTIVE CIRCUIT WITH MECHANICAL LATCH FOR SMALL APPLIANCES

Elmer W. Madsen, Bristol, Conn., assignor to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 835,125, Feb. 28, 1986, abandoned. This application Jun. 27, 1986, Ser. No. 880,643
Int. Cl.[4] H01H *47/12*
U.S. Cl. 361—178 **17 Claims**



1. A simple and reliable shock protection circuit for use within small, hand-held electrical appliances having at least a two wire power cord and a housing comprising:

an electrical connection with two opposed diodes positioned between the two power wires of a small electrical appliance said connection being between a plug connection for a power source and a load;

conductive sensor means within the housing of said appliance and connected to said electrical connection between said opposed diodes to detect the presence of a leakage current within said appliance when said appliance comes into contact with a conductive fluid and to conduct said current to ground;

said sensor means being positioned within said housing such that said sensor means is the first electrical element of said appliance to come into contact with said conductive fluid;

circuit opening means connected to said sensor means and to said electrical connection between said opposed diodes to interrupt said power wires when a leakage current above a threshold limit is detected;

means to latch said power wires in an open state when interrupted; and

means to limit the current through said sensor means to a safe level below said threshold limit and to maintain said latch in its open state.

4,712,155

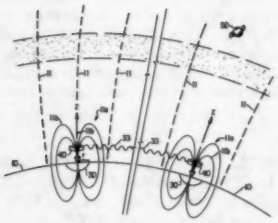
METHOD AND APPARATUS FOR CREATING AN ARTIFICIAL ELECTRON CYCLOTRON HEATING REGION OF PLASMA

Bernard J. Eastlund, Spring, Tex., and Simon Ramo, Beverly Hills, Calif., assignors to APTI, Inc., Los Angeles, Calif.

Filed Jan. 28, 1985, Ser. No. 695,517

Int. Cl.[4] H05B *6/64;* H05C *3/00;* H05H *1/46*

U.S. Cl. 361—231 **11 Claims**



1. A method of creating an artificial electron cyclotron resonance heating region of plasma at about 50 km above the earth's surface in which the collision rate of the electrons in said plasma is greater than the cyclotron frequency of said electrons, said method comprising:

establishing a first artificial magnetic field having a plurality of artificial field lines which extend from the surface of the earth through said region of plasma by

positioning a circular loop of an electrical conductive cable at the surface of the earth so that the center of said loop will be colinear with the said artificial magnetic field lines;

passing an electric current through said loop to establish said artificial magnetic field having a magnetic field strength of about 10 fold greater than the field strength naturally occurring in said region; and

transmitting first circularly polarized electromagnetic radiation having a frequency from 10 kilohertz to 30 gigahertz from the earth's surface, said transmitting being conducted essentially at the outset of transmission substantially parallel to and along said field lines of said artificial magnetic field, adjusting the frequency of said first radiation to a value which will excite electron cyclotron resonance at an initial altitude of about 50 km above the earth's surface, whereby in the region in which said electron cyclotron resonance takes place heating, further ionization, and movement of both charged and neutral particles is effected.

4,712,156

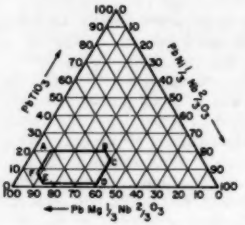
STABILIZED FERROELECTRICS

Pronob Bardhan, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,335

Int. Cl.[4] H01B *3/12;* C04B *35/46*

U.S. Cl. 361—321 **19 Claims**



1. A dielectric ceramic composition consisting essentially of $PbMg_{\frac{1}{3}}Nb_{\frac{2}{3}}O_3$, $PbNi_{\frac{1}{3}}Nb_{\frac{2}{3}}O_3$, and $PbTiO_3$ within respective ranges of 45–85 m/o, 8–40 m/o and 2–20 m/o.

4,712,157

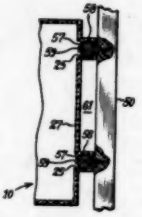
STUD MOUNTED NON-METALLIC ELECTRIC ENCLOSURE

Dale E. Simonson, and Donald H. Stoll, both of Mankato, Minn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 16, 1987, Ser. No. 26,321

Int. Cl.[4] H02B *1/04;* H05K *7/20*

U.S. Cl. 361—357 **9 Claims**



1. A molded plastic enclosure comprising:

a plastic case having electrical access means formed therein;

a molded plastic cover having means for removable attachment to said case;

electric circuit control means attached to a bottom interior of said case;

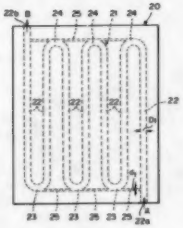
recess means formed within said bottom on an interior surface thereof and extending outward from an exterior surface of said bottom; and

metal mounting means inserted within said recess means, a fastening member passing through said metal mounting means into support.

4,712,158
COOLING SYSTEM FOR ELECTRONIC CIRCUIT COMPONENTS

Shunichi Kikuchi, Yokohama; Haruyuki Matsunaga, Atsugi; Hideo Katsumi, Sagamihara, and Koji Katsuyama, Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 26, 1986, Ser. No. 843,947
Claims priority, application Japan, Mar. 28, 1985, 60-064391
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361—385 **11 Claims**

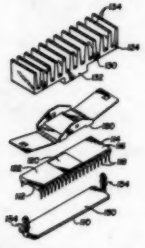


1. A cooling system for electronic circuit components mounted on a printed circuit board, including a cooling plate arranged substantially in parallel with said printed circuit board, said cooling plate having therein one or more coolant passages, thermal contact elements arranged on said cooling plate so as to be in resilient contact with the surfaces of the electronic circuit components, and means for supplying and circulating liquid coolant, through said coolant passage, so that the electronic circuit components are cooled via said thermal contact elements by said liquid coolant, characterized in that, said cooling plate has one or more shortcut passages, the cross-sectional area of which is smaller than that of said coolant passage,. to mutually connect predetermined portions of said coolant passage.

4,712,159
HEAT SINK CLIP ASSEMBLY

Donald L. Clemens, The Colony, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 851,928, Apr. 14, 1986, abandoned. This application Jul. 17, 1986, Ser. No. 886,386
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361—386 **9 Claims**



3. Heat sink apparatus for use in connection with DIP components comprising:

(a) an elongated electrically insulating member adapted for placement between the rows of leads adjacent the underside of a DIP and to extend beyond both ends of the DIP;

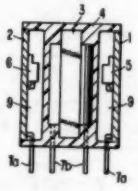
(b) a heat sink having a base portion adapted to contact the DIP on the top side thereof; and

(c) latching means adapted to secure each end of said elongated insulating member to said heat sink and maintain said DIP securely fastened between said elongated insulating member and said base portion of said heat sink.

4,712,160
POWER SUPPLY MODULE

Toshiaki Sato, Hirakata; Hisako Mori; Yashuhiko Horio, both of Osaka; Kastumi Tabuchi, Hirakata; Nobuo Matsumoto, Hirakata, and Kazuhiko Nishii, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 30, 1986, Ser. No. 880,315
Claims priority, application Japan, Jul. 2, 1985, 60-145559; Jul. 9, 1985, 60-150738
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361—388 **8 Claims**



1. A power module comprising:

a primary circuit board one major surface of which is an element mounting surface on which circuit elements of a primary circuit of a power circuit are mounted, the other major surface of said primary circuit board being a heat radiating surface on which no circuit element is mounted;

a secondary circuit board one major surface of which is an element mounting surface on which circuit elements of a secondary circuit of said power circuit are mounted, the other major surface of said secondary circuit board being a heat radiating surface on which no circuit element is mounted, said primary and secondary circuit boards being spaced apart from each other and disposed so that the respective element mounting surfaces face each other;

a converter transformer disposed in parallel with and adjacent to said primary and secondary circuit boards; and

a resin body of electrically insulating and thermally conductive resin embedding therein said primary and secondary circuit boards and said converter transformer so that said primary and secondary circuit boards and said converter transformer are three-dimensionally joined only with said resin body, said heat radiating surfaces of said primary and secondary circuit boards being exposed outside to form parts of opposite outer walls of said power module,

wherein a clearance is provided within said resin body along each of said element mounting surfaces of said primary and secondary circuit boards, said clearance being filled with an electrically insulating and thermally low conductive material for preventing heat generated on each of said primary and secondary circuit boards from being transmitted through said resin body to said converter transformer.

4,712,161

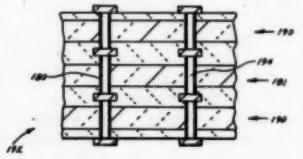
HYBRID AND MULTI-LAYER CIRCUITRY

Michael J. Pryor, Woodbridge; Charles J. Leedecke, Northford, and Norman G. Masse, Wallingford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 715,446, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 707,633, Mar. 4, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,905

Int. Cl.[4] H05K *7/06*

U.S. Cl. 361—411 **29 Claims**



13. A circuit assembly, comprising:

a ceramic substrate,

a layer of copper alloy foil, said copper alloy selected from the group consisting of oxygen free and deoxidized copper alloy; and

a layer of bonding glass which forms a flowable mass at a temperature below about 1000° C. bonding the ceramic substrate to said layer of alloy foil.

4,712,162

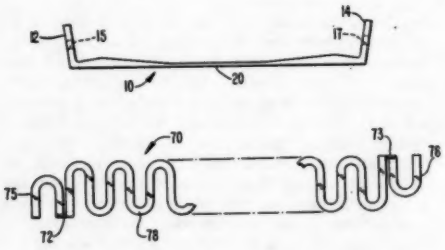
CAPACITOR HOLD-DOWN STRAP

Honesto D. Quiogue, Blacksburg, Va., assignor to Hubbell Incorporated, Orange, Conn.

Filed Dec. 4, 1986, Ser. No. 937,702

Int. Cl.[4] H05K *7/02*

U.S. Cl. 361—417 **2 Claims**



1. A capacitor hold-down strap in combination with a mounting surface against which a capacitor is to be held and fastener means attached to the mounting surface at two spaced locations between which the capacitor is to be held, the strap comprising first and seocnd L-shaped end brackets, each said bracket having two legs and means defining an opening in one leg thereof for receiving said fastener means,

said one leg being substantially flat and said opening passing therethrough perpendicular to the plane containing said one leg,

each of said end brackets being substantially rigid and non-resilient; and

and intermediate flexible and elastic elongatable strap portion extending between said end brackets for partially encompassing a capacitor positioned between said fastener means, each end of said strap portion being integrally and non-detachably connected to the other leg of one of said end brackets for elastically engaging and holding said capacitor against said surface, said intermediate strap portion comprising an elongated band of spring steel shaped to lie along a sinuous path and contained in a single plane.

4,712,163

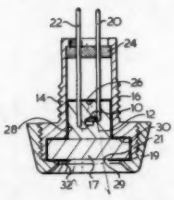
INDICATOR LAMPS

Robert F. Oxley, 89a Route de Florissant, 1206 Geneva, Switzerland

Filed Aug. 28, 1981, Ser. No. 297,319

Int. Cl.[4] G01D *11/28*

U.S. Cl. 362—29 **5 Claims**



1. In an indicator lamp having a LED light source embedded within a transparent plastics encapsulation, the improvement wherein substantially all of the surfaces of said transparent plastics encapsulation surrounding the LED are coated black except for a portion of said surfaces through which emitted light from the LED passes outwardly to the viewer.

4,712,164

VEHICLE HEADLAMP ASSEMBLY

David R. McMahan; Leslie H. Hallgarth, both of Anderson, and Gary L. Miller, Lapel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 30, 1986, Ser. No. 824,197

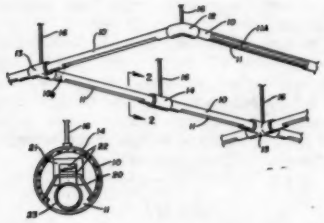
Int. Cl.[4] B60Q *1/06*; **F16C** *11/00*

U.S. Cl. 362—66 **2 Claims**

1. A vehicle lamp assembly a comprising support frame formed with upper and lower walls and a back wall, a lamp body received between said frame walls, pivot means on said upper and lower frame walls and said lamp body aligned on a vertical axis about which said lamp body is adapted for rotatable adjustment relative to said frame, means defining a pair of guidance slots in said lower walls of said frame at opposite sides of said vertical axis and each generally aligned on an arc originating on said axis and contained in generally horizontal plane, a pair of support shoes slidably received in said slots to support the mass of said lamp body on said lower wall of said frame forsaid rotatable adjustment relative thereto about said vertical axis, means combined with each of said pair of support shoes for allowing rotatable adjustment of said lamp body about a horizontal axis, and adjustment means including a pair of angularly arranged rotatable shafts journaled on said frame and interconnected by bevel gears, one of said shafts being vertically orientated and having a head adjacent said upper

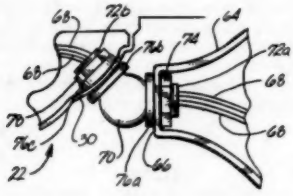
wall of said frame at a location easily manipulated from above the lamp assembly, the other of said shafts being generally horizontally disposed and having thread means engaged with one of said shoes to effect adjustment of said lamp body about said vertical axis upon selected rotation of said head of said one of said shafts.

4,712,165
TUBULAR OVERHEAD LIGHTING SYSTEM
Vincent B. Cetrone, 442 Fairway Dr. NE., Warren, Ohio 44483
Filed Sep. 5, 1986, Ser. No. 903,599
Int. Cl.[4] H01H *47/00*
U.S. Cl. 362—147 **1 Claim**



1. In a tubular lighting system having at least one plastic pipe of a known circumference with a longitudinally extending slot therein of a width at least equal to one-fourth of said known circumference of said plastic pipe and means for suspending said plastic pipe from an overhead support, the improvement comprising longitudinally spaced inverted generally U-shaped brackets positioned in said plastic pipe and straddling said slot therein, a tubular light source in said plastic pipe supported by said generally U-shaped brackets, said tubular light source being in partial registry with said elongated slot and means including an electric circuit for energizing said tubular light source.

4,712,166
LIGHT FIXTURE MOUNTING
Alva N. Stewart, Newport, Ark., assignor to Brown Jordan Company, El Monte, Calif.
Filed Feb. 24, 1986, Ser. No. 832,140
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 **1 Claim**



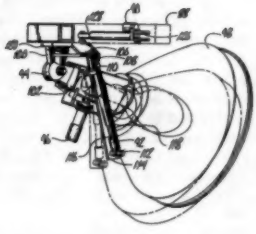
1. In a light fixture that mounts on a vertical wall and which has a top, an enclosure for a light, and a bottom, an improvement comprising:

a canopy having a base for bearing on the vertical wall, a neck extending horizontally from the base and reducing in diameter with distance from the base, and a vertical canopy end wall at the small end of the neck and having a hole through it;

the bottom of a fixture having a stamping that has a wall extending at about 45° to the horizontal, the wall having a hole through it proximate to the end wall of the canopy; and

a rigid joint connecting the stamping to the canopy, the joint having a first male threaded coupler extending through the hole in the end wall of the canopy, a second male threaded coupler 135° to the first coupler and extending through the hole in the stamping wall, a spherically curved surface between the end wall of the canopy and the stamping, a first washer on the first male threaded coupler between the end wall of the canopy and the spherically curved surface, a first nut on the first male threaded coupler holding the joint and the canopy together, a second washer on the second male threaded coupler between the stamping and the spherically curved surface, and a second nut on the second male threaded coupler holding the joint and the stamping together.

4,712,167
REMOTE CONTROL, MOVEABLE LIGHTING SYSTEM
Myron K. Gordin, and James L. Drost, both of Oskaloosa, Iowa, assignors to Mycro Group Co., Oskaloosa, Iowa
Filed Jun. 30, 1986, Ser. No. 880,187
Int. Cl.[4] F21P *5/02*
U.S. Cl. 362—233 **16 Claims**



1. A self-powered, mobile, controllable, and variable effect lighting device for high power, high intensity large scale lighting applications comprising:

a mobile base platform which is moveably positionable along the ground;

a boom mounted upon said base platform and having an outer end which is adjustably swivelable, tiltable, collapsible and extendable with respect to said base platform;

a lighting array frame adjustably mounted to said outer end of said boom, said lighting array frame being indepen-

dently tiltable in addition to being orientational according to the adjustable positioning of said boom;

at least one luminaire assembly unit, each producing a lightbeam and being adjustably mounted to said lighting array frame, each said luminaire assembly unit being independently pannable and tiltable in addition to being orientational according to the adjustable positioning of said boom;

luminaire mounting means connected between each said luminaire assembly unit and said lighting array frame for adjustably mounting each said luminaire assembly unit to said lighting array frame to allow independent panning and tilting of each luminaire assembly unit;

actuator means operatively associated with said luminaire mounting means and said lighting array frame for causing adjustable panning and tilting of each said luminaire assembly unit with respect to said lighting array frame;

first motor means operatively associated with the said lighting array frame for causing the adjustable movement of said lighting array frame with respect to said boom;

second motor means operatively associated with each said luminaire assembly unit for allowing selective adjustment of the width of said corresponding light beam;

power means operatively associated with said boom for causing adjustable movement of said boom with respect to said base platform;

generator means on said mobile base platform for producing different electrical power levels, including sufficient electrical power to operate the high power, high intensity large scale lighting of each said luminaire assembly unit, and for producing sufficient electrical lower-levels of power for other elements of the lighting device, and for auxiliary devices;

control circuitry mounted to said base platform for supplying operating power from said generator means to each said luminaire assembly unit, actuator means, first and second motor means, and power means;

ballast means secured to said mobile base platform to provide ballast between said generator means and each of said luminaire assembly unit;

switching means operatively connected between said generator means and said ballast means to provide switching for the high electrical power for each said high intensity, large scale lighting luminaire assembly unit, said switching means being controlled by signals from said control circuitry; and

control means associated with and in operative communication with said control circuitry for allowing control of the beam of orientation of each luminaire assembly unit and of the vertical and horizontal positioning of said lighting array frame, said control means including first and second manual control panels, said first control panel being positioned on said mobile base platform and operatively connected by electrical conduits to said control circuitry, said second control panel being operatively connected to said control circuitry and being manually moveable to a location away from said mobile base platform.

16. A method of providing self-powered, moveable, controllable, variable lighting, high power, high intensity large scale lighting applications for target areas such as for movie sets and the like comprising:

moving a moveable base including an adjustably positionable swivelable, tiltable, collapsible and extendable boom with and adjustably positionable lighting array frame having a plurality of adjustably positionable luminaire assembly units mounted thereon to a desired position relative to said target area said luminaire assembly units being independently pannable and tiltable in addition to being orientational according to adjustable positioning of the lighting array frame and the boom;

adjusting said boom to a desired position relative to said target area;

orienting said lighting array frame to a desired position relative to said target area by remote control at a position remote from said lighting array frame;

orienting at least one of said luminaire assembly units as desired with respect to said target area by remote control at a position remote from said luminaire assembly unit;

generating electrical power from a generator means positioned on said moveable base to deliver sufficiently high power to operate each said luminaire assembly unit and to deliver sufficient power to various other power levels for use by electrical activators and motors to adjustably position said boom, lighting array frame, and each luminaire assembly unit to desired orientations;

producing a light beam for each utilized luminaire assembly unit according to desire with respect to said target area by remote control at a position remote from said luminaire assembly unit; and

adjusting the beam characteristics or orientation of any said luminaire assembly unit, the position of said lighting array frame or boom, or the position of said moveable base with respect to said target area to achieve the desired lighting characteristics at said target area by remote control at a position remote from any said luminaire assembly unit, said lighting array frame, and said boom.

4,712,168

SPOTLIGHT BRACKET FOR A FALSE CEILING OR A FALSE WALL

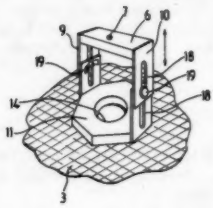
Fernand Scherrer, 2, rue Georges Bizet, 68170 Rixheim, France

Filed Sep. 9, 1986, Ser. No. 905,780

Claims priority, application France, Sep. 13, 1985, 85 13619

Int. Cl.[4] F21S *1/02*

U.S. Cl. 362—427 **12 Claims**



1. Spotlight bracket for a false ceiling or a false wall, comprising:

upper and lower parts adjustable relatively to each other, said upper part being adapted for fixing to a ceiling or wall, and said lower part being adjustable both in height and in inclination relative to said upper part;

said lower part including a base plate having a hole pierced therethrough for the passage of a spotlight borne by the bracket.

4,712,169

CIRCUIT ARRANGEMENT FOR FORMING A DIRECT VOLTAGE FROM A SINUSOIDAL INPUT VOLTAGE

Manfred Albach, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1986, Ser. No. 929,469

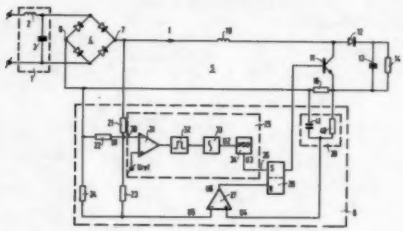
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541308

Int. Cl.[4] H02M *3/156*

U.S. Cl. 363—89 **11 Claims**

1. A circuit arrangement for forming a direct voltage from an essentially sinusoidal input voltage comprising: a filter for suppressing high-frequency interference signals, a switched mode power supply part which includes a diode, a coil, a capacitor and a transistor and is coupled to the filter through a rectifier, the elements of the switched mode power supply

being coupled together in circuit so that, in the conductive state of the transistor the diode is cut off and the coil current flows at least through the transistor, and in the transistor cut-off state the current flows through the diode and a parallel arrangement of a load and the capacitor, and a pulse generator responsive to the input voltage to derive switching pulses for the transistor whose frequency is varied uniformly in time between a minimum frequency at the maximum value of a rectified input voltage and a maximum requency at the minimum value, characterized in that the pulse enerator comprises a voltage-to-frequency converter which froms, from the input



voltage, starting pulses, which determine the beginning of the switching pulses and whose frequency is varied between the extreme values in such a manner that the second derivative of the frequency with respect to time is always zero or negative, in that the pulse generator further comprises a first comparison circuit and a first integrator, which integrator produces an output signal proportional to the integrated output current of the rectifier and whose time constant is smaller than the reciprocal value of the maximum frequency, and in that the first comparison circuit produces a signal for terminating a switching pulse when the output signal of the first integrator is larger than a signal proportional to the rectified input voltage.

4,712,170

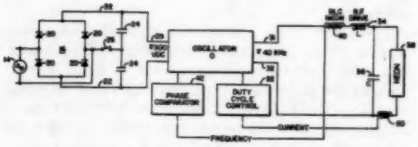
POWER SUPPLY HAVING TUNED RADIO FREQUENCY CIRCUIT

Alan G. V. Grace, San Bruno, Calif., assignor to Power Modifications Incorporated, Hayward, Calif.

Continuation-in-part of Ser. No. 727,180, Apr. 25, 1985. This application Feb. 6, 1986, Ser. No. 826,942

Int. Cl.[4] H02P *13/20*

U.S. Cl. 363—98 **12 Claims**



1. A tuned radio frequency power supply for powering a load comprising in combination:

an oscillator having a variable frequency and variable power driving source;

an RLC circuit having a load connected thereto and including a first inductance reactance element and a second capacitance reactance element said RLC circuit connected to the output of said oscillator, said inductance reactance element being a transformer, said transformer sized to emphasize the third harmonic of the frequency of said RLC circuit;

a frequency sensor connected across the current flow in the RLC circuit outputting to a phase comparator;

a phase comparator for comparing the phase of the oscillator with the phase of the circuit for changing the frequency of the oscillator to tune said circuit for minimum reactance load and maximum resistive load;

a sensor operatively connected to the power driving source of the oscillator for sensing the power sufficient to drive the load and varying the variable power driving source to said oscillator, said sensor outputting to the variable power driving source to cause said oscillator to have an amplitude sufficient to force a required level of voltage and current through the RLC circuit.

4,712,171

ELECTRICAL POWER SOURCE

Toshihiko Yamashita, Osaka, Japan, assignor to Uniqey (Hong Kong) Limited, Hong Kong

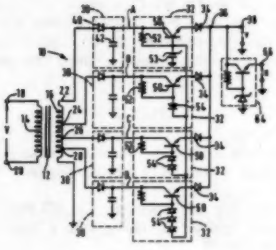
PCT No. PCT/GB86/00152, § 371 Date Jan. 15, 1987, § 102(e) Date Jan. 15, 1987, PCT Pub. No. WO86/05636, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 14, 1986, Ser. No. 939,516

Claims priority, application United Kingdom, Mar. 15, 1985, 8506739

Int. Cl.[4] H02M *1/10*

U.S. Cl. 363—142 **5 Claims**

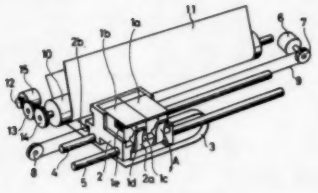


1. An electrical power source capable of accepting an input within a range of AC input voltages and providing a substantially constant DC output supply, comprising converter means for providing from the AC input supply a number of outputs of differing voltages each proportional to the input voltage, each of these outputs being connected respectively to one of a number of parallel circuit lines each of which includes a rectifier, a maximum voltage regulator and non-return current device, the outputs of these lines being connected to a common output intended to provide the substantially constant DC voltage supply, each voltage regulator having a set regulating voltage which is one of a discrete range of voltage steps close to the required substantially constant DC voltage, the lowest of the steps being no greater than the voltage reached for the line connected to the highest output from the converter means when the input supply is at the low end of the range of AC voltages, the next of the steps being greater than the lowest and being reached for the line connected to the next highest output from the converter means, and, if there are more than two parallel circuit lines, the next step being greater and being reached for the line connected to the next highest output from the converter means and so on, so as to cover the whole range of possible input AC voltages.

4,712,172
METHOD FOR PREVENTING NON-DISCHARGE IN A LIQUID JET RECORDER AND A LIQUID JET RECORDER

Takehiko Kiyohara, Zama; Koji Terasawa, Mitaka, and Akira Miyakawa, Tanashi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,396
Claims priority, application Japan, Apr. 17, 1984, 59-75866
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **18 Claims**



1. A method for preventing non-discharge of liquid in a liquid jet recorder, comprising the steps of:

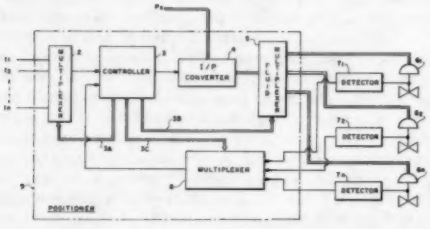
providing a recorder having a record head for discharging liquid to record dots, said record head having a discharge energy generating element for generating heat when energized arranged on a substrate, a liquid discharge port arranged in relation to the discharge energy generating element to discharge liquid when the energy generating element is energized in a discharge mode and a liquid path for supplying liquid to the liquid discharge port; and

energizing the discharge energy generating element in a non-discharge mode, wherein liquid is not discharged, when the recorder is powered on and/or when the time during which the recorder has not operated in the discharge mode exceeds a predetermined time period.

4,712,173
MULTICONTROL PROCESS CONTROL SYSTEM

Masatoshi Fujiwara, Yokoshuka; Masato Kuroda, Fujisawa, and Tatsuhide Shiga, Zushi, all of Japan, assignors to Yamatake Honeywell, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 777,987
Claims priority, application Japan, Oct. 1, 1984, 59-204174; Oct. 9, 1984, 59-210391
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—138 **20 Claims**



1. A multicontrol system comprising

an input multiplexer for selecting a plurality of input signals,

a detecting multiplexer for selecting detected signals indicative of the condition in which a plurality of devices respond,

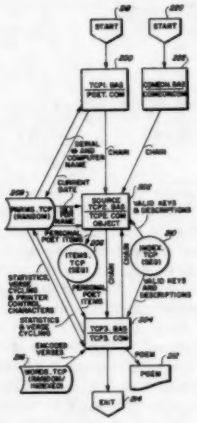
an output multiplexer for selectively delivering a control output to the plurality of devices to be controlled and

a controller for controlling the multiplexers for successive and repeated selective operation, for effecting a controlling arithmetic operation on an input signal fed through said input multiplexer and a detected signal fed through said detecting multiplexer, and for delivering a control signal resulting from said controlling arithmetic operation as an input to said output multiplexer.

4,712,174
METHOD AND APPARATUS FOR GENERATING TEXT

Jackson D. Minkler, II, Phoenix, Ariz., assignor to Computer Poet Corporation, Sparks, Nev.

Filed Apr. 24, 1984, Ser. No. 603,731
Int. Cl.[4] G06F *9/06*
U.S. Cl. 364—200 **36 Claims**



1. A method for using a computer for producing pseudorandom output text respnsive to a plurality of input data set items, provided by an operator to the computer, according to the following steps:

inputting a plurality of text blocks as a data base for the computer, each of said plurality of text blocks being identified as one of a plurality of characterizations;

querying the operator for the plurality of input data set items, all of the plurality of input data set items being related to a single intended recipient of the pseudorandom output text, said at least single intended recipient being predetermined by and identified to the computer by the operator;

producing a different portion of the pseudorandom output text in response to each of the plurality of input data set items, said responsive output portions being related to each of the plurality of input data set items by means of said plurality of characterizations, each of said responsive output portions being selected sequentially from a plurality of said responsive related output portions; and

outputting the pseudorandom output text to a plotter.

4,712,175
DATA PROCESSING APPARATUS

Shunichi Torii, Musashino; Shigeo Nagashima, Hachioji, and Koichiro Omoda, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,981
Claims priority, application Japan, Jul. 27, 1983, 58-135816
Int. Cl.[4] G06F *15/347, 15/16*
U.S. Cl. 364—200 **9 Claims**

1. A vector data processing data processing apparatus for processing vector data including a plurality of data elements comprising more than two sub-systems each including:

(a) at least one operation unit for performing an arithmetical

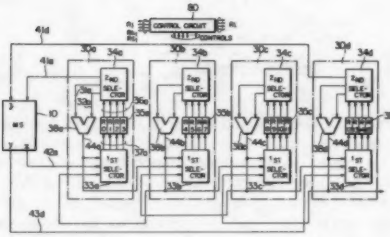
or logical operation on two input vector data and for outputting result vector data of said operation;

(b) a plurality of vector registers each for holding vector data and each being capable of performing reading and writing operation concurrently;

(c) a first selector connected to input terminals of said vector registers only in the same subsystem and connected with the operation unit in the same subsystem and an operation unit in a plurality, but less than all, of the different subsystem so as to receive vector data therefrom and for selectively outputting the received vector data to one vector register only in the same subsystem; and

(d) a second selector connected to output terminals of said vector registers only in the same subsystem and to a pair of input terminals of said operation unit only in the same subsystem for receiving a pair of vector data from a pair of selected vector registers in said vector registers only in the same subsystem and for outputting the received pair of vector data to said operation unit only in the same subsystem; and

control means connected to said plurality of subsystems and responsive to program instructions for controlling operations of said first selectors and said second selectors in said



plurality of subsystems and for controlling read and write operations of said vector registers in said plurality of subsystems, said control means including means for controlling said second selector included in a first one of said plurality of subsystems which includes a first vector register register designated by one program instruction as a vector register to provide vector data held thereby so that the held vector data is transferred to said operation unit included in said first subsystem, and for controlling said first selector included in a second one of said plurality of subsystems which includes a second vector register designaed by said one program instruction as a vector register to receive vector data, so that vector data provided by said operation unit included in said first subsystem is transferred to said vector register, and said control means including means for controlling a write operation and a read operation to one of said vector registers in said plurality of subsystems so that vector data written into the one vector register is read out concurrently with the write operation thereof, when the one vector register is designated by a preceding program instruction as a vector register to receive vector data and is designated by a succeeding program instruction as a vector register to provide vector data held thereby.

4,712,176

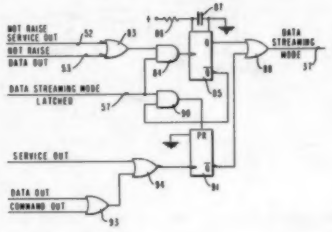
SERIAL CHANNEL INTERFACE WITH METHOD AND APPARATUS FOR HANDLING DATA STREAMING AND DATA INTERLOCKED MODES OF DATA TRANSFER

Kenneth J. Fredericks; Thomas W. Guerriero, both of Poughkeepsie; Gerald H. Miracle, Pleasant Valley, and Michael R. Wiegand, Poughkeepsie, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,355

Int. Cl.[4] G06F *13/42*

U.S. Cl. 364—200 **7 Claims**



1. Apparatus (the X box or Y box) for exchanging signals between a serial link and a parallel buss connected to one of a channel and a control unit,

the channel and control unit having means for transferring a series of data units on the parallel bus in a data streaming mode using alternating first and second data transfer tags from the control unit to the channel (Service In alternating with Data In) and corresponding alternative first and second tags from the channel to the control unit (Service Out alternating with Data Out) or in an interlocked mode,

the serial link connecting said apparatus in both directions (Input and Output) with a similar apparatus (another X or Y box) also connected by a parallel bus to the other of said channel and control unit,

said apparatus having means for receiving said data transfer tags on said parallel bus and transmitting on said serial link a frame containing the identification of the received tag and having means for receiving a serial frame containing the identification of one of said data transfer tags and raising the corresponding data transfer tag on the parallel bus,

wherein the improvement comprises,

means (**70, 77, 79, 80**) for detecting said interlocked mode of data transfer and said data streaming mode of data transfer on the parallel bus and means (**71**) for producing a signal (**57**) identifying whether the channel and control unit are operating in data streaming mode,

means (**35, 36, 42, 44, 46, 47**) responsive to said signal identifying that said channel and control unit are operating in data streaming mode for dropping a data transfer tag on the parallel bus in response to the receipt of the next of said data transfer tags in said series of data units on the serial bus, and

means responsive to said signal identifying that said channel and control unit are operating in data streaming mode for detecting the end of the data transfer and for controlling said tag dropping means to drop a last data transfer tag.

4,712,177

CIRCUIT FOR A CORD CARRIER HAVING A MEMORY AND AN ACCESS CONTROL UNIT FOR SECURE DATA ACCESS

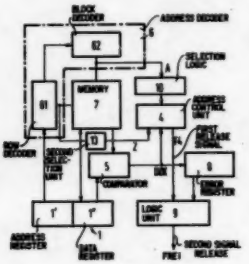
Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,873

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318083

Int. Cl.[4] G06F *11/34*

U.S. Cl. 364—200 17 Claims



1. Monolithic circuit disposed in a carrier card, being in cooperative engagement with a card reader having a validation data input, comprising a memory having electrically writable and erasable non-volatile storage cells and a memory region having an addressing space subdivided into a plurality of partial quantities of respective addresses receiving reference data, an addressing circuit connected to said memory for reading out, writing and erasing partial regions of said memory, a control unit connected to said memory and to said addressing circuit causing access to part of the memory addresses to be dependent on an input operation through said addressing circuit, said control unit including a data comparison unit carrying out comparison operations between a plurality of stored reference data and externally entered code data, an error register connected to said comparison unit for storing an error if non-agreement is determined between said stored reference data and said externally entered code data, address lines connected to said memory, a selection logic connected to said address lines for determining, according to a predetermined order, said partial quantitites together with said address lines, and an address control unit connected to said address lines through said selection logic for delivering a first release signal for confirming the validity of said validation data if at least one address was selected from each partial quantity during said comparison operations, and a logic unit connected to said error register and said address control unit for generating a second release signal in response to said first release signal and no error being stored in said error register.

4,712,178

MALFUNCTIONING COMPUTED TOMOGRAPHY DETECTOR CORRECTION METHOD

Heang K. Tuy, Cleveland, and Narasimharao Koka, Richmond Heights, both of Ohio, assignors to Picker International Inc., Highland Heights, Ohio

Continuation of Ser. No. 675,623, Nov. 28, 1984, abandoned. This application Feb. 10, 1987, Ser. No. 13,159

Int. Cl.[4] A61B *6/02*

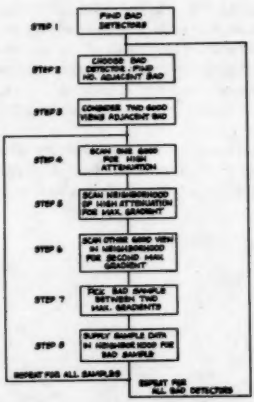
U.S. Cl. 364—414 14 Claims

1. In a computed tomography scanner of a type where multiple closely spaced radiation detectors detect radiation intensity at multiple times during a subject study, a method for reconstruction imaging comprising the steps of:

identifying malfunctioning detector groups with each such group being comprised of one detector or a plurality of adjacent detectors;

examining consecutive sensed intensity readings from a first functioning detector closely positioned in relation to a first group of one or more malfunctioning detectors to identify a first high contrast reading corresponding to a high contrast region within a scanning subject;

examining consecutive sensed intensity readings from a second functioning detector separated from the first functioning detector by said first group of one or more malfunctioning detectors to indentify a second high contrast reading corresponding to said high contrast region;



interpolating said first and second high contrast readings to obtain one or more interpolated intensity readings corresponding to one or more malfunctioning detectors; supplying said one or more interpolated intensity readings to said one or more malfunctioning detectors; and attributing said interpolated intensity readings to the one or more malfunctioning detectors in the first malfunctioning detector group to approximate data which would have been sensed by said one or more malfunctioning detectors;

repeating the examining and supplying steps for each of said malfunctioning detector groups; and

using both sensed intensity readings from functioning detectors and interpolated intensity readings for malfunctioning detector groups to reconstruct an image of said subject.

4,712,179

METHOD AND APPARATUS FOR CALIBRATING INTERNAL MEASUREMENTS OF AN IMPLANTED CARDIAC PACER

Malcolm L. Heimer, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 641,186, Aug. 15, 1984, abandoned. This application Feb. 5, 1987, Ser. No. 15,492

Int. Cl.[4] G06F *15/42*; A61N *1/36*

U.S. Cl. 364—417 6 Claims

1. A method of calibrating internal measurements obtained through plated resistors formed on an integrated circuit in an implanted cardiac pacer, comprising the steps of:

measuring uncorrected values through plated resistors by an internal measurement circuit relative to at least one of battery conditions and pulses from a pacing circuit;

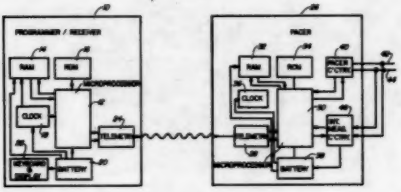
obtaining correct values during the manufacturing process by a precise external instrument relative to at least one of the battery conditions and the pulses from the pacing circuit;

comparing the uncorrected values with the correct values in order to provide correction factors;

storing the correction factors for the uncorrected values in a memory device located within the implant;

telemetering uncorrected values and the correction factors to an external programmer/receiver;

computing corrected values in the external programmer/-



receiver from the telemetered uncorrected values and the telemetered correction factors in order to compensate effectively for the difference between the actual values of the resistors and the precise values of the resistors, so that the necessity of mechanically trimming the resistors to be of precise values after manufacturing is eliminated.

4,712,180

EDITING SYSTEM OF EDUCATIONAL PROGRAM FOR A COMPUTER ASSISTED INSTRUCTION SYSTEM

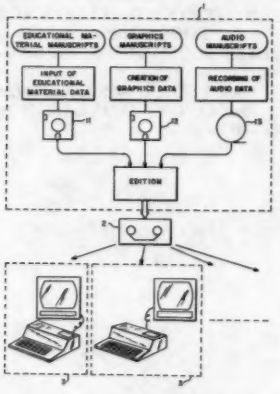
Seiki Fujiyama, Taito, and Myonghi Lee, Bunkyo, both of Japan, assignors to Sillony Company Limited, Hong Kong

Filed Sep. 10, 1984, Ser. No. 649,218

Claims priority, application Japan, Sep. 12, 1983, 58-168077

Int. Cl.[4] G06F *15/38*; G06G *7/60*

U.S. Cl. 364—419 **26 Claims**



1. An educational material program editing system for a computer assisted instruction system, comprising:

input means for inputting data, including question information to be assigned to a student;

storing means for storing eductional material data formed by the data inputted by said input means;

first recording means for recording audio data relating to said question information;

relocating means for relocating the layout of said eduction material data stored in said storage means on the basis of the audio data recorded by said first recording means; and

second recording means for recording said relocated educational material data and said audio data in parallel on a recording medium so that said relocated eductional material data is related to said audio data on said recording medium to form an educational material program.

4,712,181

METHOD OF COMBATING DIFFERENT TYPES OF AIR TARGETS

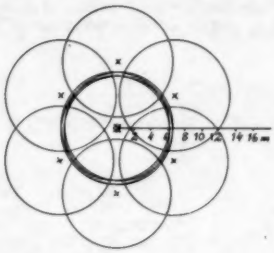
Kurt Dahlberg, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Sep. 4, 1985, Ser. No. 772,520

Claims priority, application Sweden, Sep. 4, 1984, 8404403

Int. Cl.[4] G06F *15/48*

U.S. Cl. 364—423 **5 Claims**



1. A method of optimizing target coverage for a computer-controlled automatic gun anti-aircraft defense system equipped with proximity fuze activated explosive shells, comprising the steps of:

programming a computer which controls the laying and firing of the gun to distribute upon firing the predetermined number of shells included in each round shell by shell, so that these form at a calculated firing range a predetermined hit pattern with its focal point in the calculated position of the target and in which the distance in meters between the individual shells in the round on the calculated firing range is always the same regardless of the calculated distance to the target, and the activation range for the proximity fuze of each shell partly overlaps the activation range for the proximity fuzes for adjacent shells in the hit pattern; and,

selecting said hit pattern and the position for each individual shell therein upon determination of a performed target identification and the calculated altitude of the target.

4,712,182

METHOD OF ESTIMATING FRACTURE POINT OF PIPE LINE NETWORK

Fumio Wakamori, Machida; Hideo Ohata; Shinichiro Miyaoka, both of Kawasaki, and Motohisa Funabashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 587,527, Mar. 8, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 841,827

Claims priority, application Japan, Mar. 9, 1983, 58-37396; Jun. 24, 1983, 58-112724; Oct. 14, 1983, 58-190727

Int. Cl.[4] G01M *3/28*; G06F *15/36, 15/56*

U.S. Cl. 364—507 **6 Claims**

6. A method of estimating a disruption point in a large scale distribution network provided therein with junction points and with a disruption monitoring system, comprising the steps of

(a) selecting a set of suspected abnormal junction points in the network, said junction points having data which are all known in a normal condition of the network;

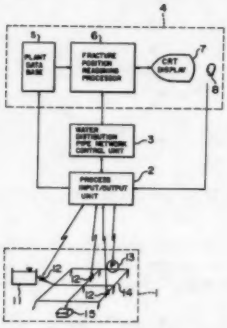
(b) obtaining measured data at certain suspected abnormal junction points in said set of suspected abnormal junction points,

(c) successively applying via a processor a set of estimating rules for identifying said disruption point, to the thus measured data and the data in the normal condition of the network;

(d) successively applying via the processor a set of estimating rules for identifying said disruption point, to reference data at certain junction points in said set in said normal

condition and the measured data so as to obtain changes in value from the data in the normal condition at junction points to the extent possible,

(e) withdrawing junction points with said value changes which are known, regarded as those in the normal condition, other than a junction point with a maximum one of said value changes, from said set of suspected abnormal junction points, searching junction points along branches around said junction point with said maximum value change until a junction point not belonging to the initial set of suspected abnormal junctional points is found, and renewing said set of suspected abnormal junction points



with the use of junction points obtained during searching and now yet evaluated as to their condition, and including said junction point with the maximum value change,

(f) displaying said new set of suspected junction points on a display unit for checking the condition of said network,

(g) repeating the application of said rules via the processor to the suspected junction points in said renewed set to suspectively reduce the number of suspected abnormal junction points in the renewed set until the disruption point is located, and

(h) outputting said located disruption point for repairing the same.

4,712,183

TRACKING ROBOT APPARATUS

Osamu Shiroshita; Yasuo Ishiguro, and Yoshizumi Itou, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Toyota Jidosha Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 6, 1985, Ser. No. 763,127

Claims priority, application Japan, Aug. 6, 1984, 59-163804

Int. Cl.[4] G06F *15/46;* **G05B** *19/42*

U.S. Cl. 364—513 **22 Claims**

1. A tracking robot apparatus, comprising:

a robot for performing a predetermined operation;

a movable device for moving an object of interest;

a signal input device for designating operations of said robot and said movable device;

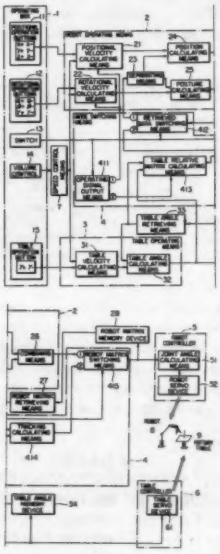
first operating means for receiving an input signal from said signal input device and calculating an operation instruction value of said movable device;

a first control device for driving said movable device in accordance with the operation instruction value;

second operating means for calculating a position/posture instruction value serving as an operation instruction value of said robot based upon said operation instruction value of said movable device so as to keep the relative position and posutre of said robot and said movable device unchanged; and

a second control device for driving said robot in response to the position/posture instruction value,

said movable device being operated in response to the signal from said signal input device, and at the same time said robot being operated such that the relative position and



posture of said robot and said movable device are kept unchanged.

4,712,184

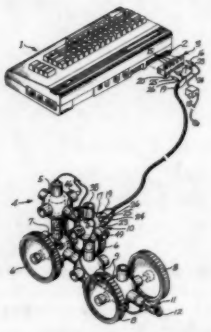
COMPUTER CONTROLLABLE ROBOTIC EDUCATIONAL TOY

Albert R. Haugerud, 1544 Hillside Dr. Southeast, Issaquah, Wash. 98027

Filed Sep. 12, 1984, Ser. No. 649,862

Int. Cl.[4] G06F *15/46;* **G09B** *19/00*

U.S. Cl. 364—513 **9 Claims**



1. In a computer-controllable robotic device using a multipurpose microcomputer including an output port having several discrete input and output contacts, such microcomputer having programming modifiable to control the computer to provide a high or low voltage output signal to a selected single output contact of such port, and a robot having a plurality of different electrically-powered actions, the improvement comprising an interface operably connectable between such microcomputer port and such robot and including power-controlling means for receiving the output signal from such selected single output contact of the microcomputer port and for supplying electric power to the robot for effecting various

different selected electrically-powered actions of the robot as determined by the programming of the microcomputer without reference to or being affected by the voltage at any other output contact of the microcomputer output port.

4,712,185
DOT INTERPOLATION CONTROL SYSTEM

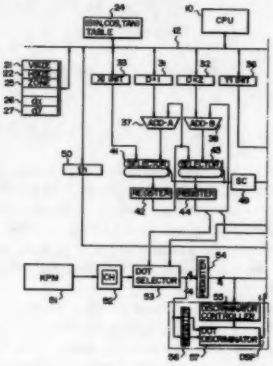
Hiroyuki Aoki, Hanno, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

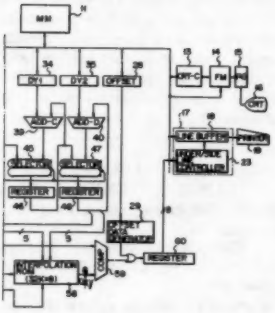
Filed Apr. 26, 1985, Ser. No. 727,910

Claims priority, application Japan, Apr. 28, 1984, 59-86371; Apr. 28, 1984, 59-86372; Apr. 28, 1984, 59-86373; Apr. 28, 1984, 59-86375; Apr. 28, 1984, 59-86376

Int. Cl.[4] G06F *15/626*; G06K *9/42*

U.S. Cl. 364—518 **14 Claims**





1. A dot interpolation control system for dot-interpolating a character pattern comprising:

first operating means for calculating initial values and dot pitches along main and subscanning directions in accordance with x and y component data and angle component data;

first storage means for storing an initial value along said main scanning direction, calculated by said first operating means;

second storage means for storing an initial value along said sub scanning direction, calculated by said first operating means;

third storage means for storing a dot pitch along said main scanning direction calculated by said first operating means;

fourth storage means for storing a dot pitch along said sub scanning direction calculated by said first operating means;

fifth storage means for storing dot position data along said main scanning direction;

sixth storage means for storing dot position data along said sub scanning direction;

second operating means for: (1) initially loading the data stored in said first storage means and said second storage means into said fifth storage means, (2) calculating dot positions along said main scanning direction in accordance with the contents of said third and fifth storage means, and (3) storing the calculated dot positions in said fifth storage means; and

third operating means for: (1) initially loading the data stored in said first and second storage means into said sixth storage means, (2) calculating the dot positions along the sub scanning direction in accordance with the contents of said fourth and sixth storage means, and (3) storing the calculated dot positions along the sub scanning direction in said sixth storage means, so that said sixth storage means includes sub scanning direction data.

4,712,186
METHOD OF DETERMINING ROTARY SPEED OF A ROTATING ELEMENT IN A BRAKING EFFORT REGULATION SYSTEM

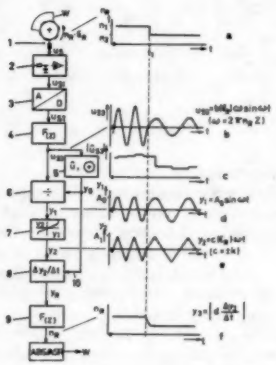
Georg Fromme, Seevetal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,983

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432883

Int. Cl.[4] B60K *31/00*; G01P *3/00*; G06G *7/70/7/76*

U.S. Cl. 364—565 **11 Claims**



1. In a system for preventing slippage of at least one wheel of a vehicle, a method of regulating wheel braking effort as a function of rotary speed of a vehicle wheel subject to wide speed variations and of providing control output signals representative of wheel speed even under slow wheel operating conditions, said slippage-preventing system having

a transducer (1) which provides a transduced output signal (u_S) having a frequency representative of the speed of the wheel and an evaluation circuit (2–9) which processes said transducer output signal (u_S) and provides the control output signal (n_R) which has a characteristic value which is representative of and proportional to the speed of the wheel,

comprising the steps of

digitizing the transducer output signal (u_S) to derive a digital signal (u_{S2});

calculating (7) the inverse function of the digital signal to derive an essentially triangular-wave-shaped signal (y_2);

determining (8) the degree of slope of the essentially linear portions of the triangular-wave-shaped signal (y_2) to derive a differentiated signal (y_3), which differentiated signal is representative of the speed of the wheel;

obtaining said control output signal (n_R) from the differentiated signal (y_R); and

regulating braking effort in said slippage-preventing system as a function of said control output signal (n_R).

4,712,187

AUTOMATIC CENTERING METHOD FOR A VIDEO CAMERA

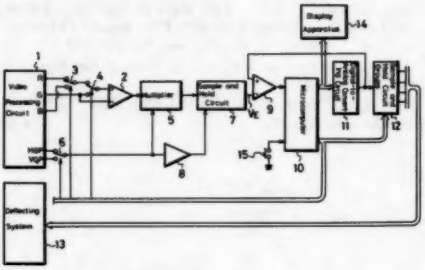
Eiji Tamura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,288

Claims priority, application Japan, Apr. 16, 1984, 59-76278

Int. Cl.[4] G01C *25/00*; H04N *9/09*

U.S. Cl. 364—571 **4 Claims**



1. An automatic centering method for a video camera having a plurality of pick-up means producing respective outputs and respective deflection control circuit for each of said pick-up means for causing a deflection of the respective pick-up means within a predetermined centering range in response to a respective control signal, said method preventing completion of a centering operation to an erroneous centered position within said centering range, comprising the steps of:

comparing the outputs of first and second ones of said pick-up means to generate an error signal indicative of a centering deviation between said first and second pick-up means;

processing said error signal to generate a control signal for said first pick-up means so as to minimize said centering deviation;

supplying the generated control signal to said deflection control circuit for said first pick-up means so that said first pick-up means is deflected to a centered position in said centering range;

storing said generated control signal in a memory;

changing said generated control signal supplied to said deflection control circuit for said first pick-up means by a predetermined amount so that said first pick-up means is deflected to a second position in said centering range remote from said centered position;

repeating the above-described steps of comparing, processing and supplying to generate a new control signal minimizing centering deviation and to supply the same to said deflection control circuit for said first pick-up means;

comparing said new generated control signal with said control signal stored in said memory to generate an error flag signal when the compared control signals do not coincide with each other; and

indicating said error flag signal.

4,712,188

PATTERN OUTPUT APPARATUS

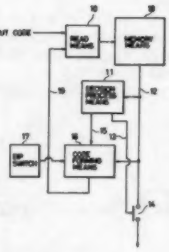
Masaki Nishiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,052

Claims priority, application Japan, Jan. 31, 1984, 59-14296

Int. Cl.[4] G06F *3/14*

U.S. Cl. 364—900 **10 Claims**



1. A pattern output apparatus comprising:

memory means for storing a plurality of pattern information;

input means for inputting code information to said apparatus;

read means connected to said memory means and to said input means for reading out said pattern information corresponding to said code information, from said memory means;

decision means connected to said memory means for discriminating a bit data within said pattern information read out by said read means to produce a discrimination result and for outputting said discrimination result; and

code information output output means connected to said memory means and to said decision means for generating, in response to said discriminatiaon result, generated code information indicating that pattern information different from said read out pattern information should be read out from said memory means, wherein said generated code information is output to said read means.

4,712,189

TABLE DRIVEN TRANSLATOR

Shunji Mohri, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,944

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—900 **9 Claims**

1. A language processing system for translating an input statement of a selected source language into a lower-level machine-oriented language comprising:

(a) input means for inputting an input statement written in the selected source language of a computer;

(b) storage means for storing

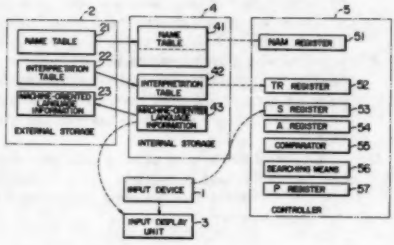
a first table for storing keywords of grammer of said selected source language and characteristics of the keywords and for storing characteristics of variables used in a program coded by said selected source language;

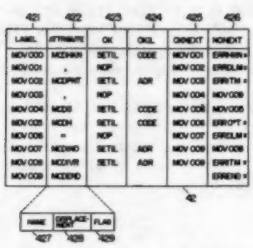
a second table for storing information of control procedures for interpreting the input statement to translate the input statement into a lower-level machine-oriented language, said information being predetermined and based on syntax/grammer of the selected source language;

(c) control means for controlling translation processing of an input statement written in the selected source language from said input means, said control means including searching means responsive to said input statement for searching said first table to obtain a location therein at

which a desired keyword variable is stored and to obtain an attribute associated with said keyword variable;

comparing means for comparing said attribute from said searching means with a corresponding attribute stored in said second table to check whether the syntax of the input statement meets the grammer of said selected souce language; and





converting means responsive to a determination of a match between said attributes as a result of the comparison by said comparing means, for converting said input statement into a lower-level machine-oriented language based on a predtermined conversion rule.

4,712,190

SELF-TIMED RANDOM ACCESS MEMORY CHIP

Paul M. Guglielmi, Westboro, Mass.; Ronald J. Melanson, Sunnyvale, Calif., and Alan Kotok, Harvard, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 25, 1985, Ser. No. 694,874

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—900 **6 Claims**

1. A self-timed random access memory on a monolithic integrated circuit chip including data input terminal means for receiving data input signals, address signal terminal means for receiving address signals, memory operation control signal terminal means for receiving a memory operation control signal and timing signal terminal means for receiving a timing signal and data output terminal means for transmitting data output signals, said chip further including:

A. data storage means connected to said data input terminal means and said timing signal terminal means for storing data representative of said data input signals at said data input terminal means in response to the receipt said timing signal;

B. address signal storage means connected to said address signal terminal means and said timing signal terminal means for storing an address representative of said address signals at said address signal terminal means in response to the receipt of said timing signals;

C. control signal storage means connected to said memory operation control signal terminal means and said timing signal terminal means for storing control data representative of said memory operation control signals at said memory operation control signal terminal means in response to the receipt of said timing signal;

D. data output storage means connected to said data output terminal means and said timing signal terminal means for storing data for transmission to said data output terminal means in response to the receipt of said timing signal;

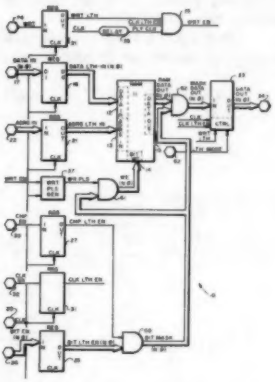
E. control signal generating means connected to said control signal storage means for generating an internal memory operation control signal in response to the memory operation control data stored in said control signal storage means and the receipt of said timing signal, said control signal generating means including:

i. timing signal delay means connected to said timing signal terminal means for generating a delayed timing signal,

ii. enabling signal generating means having an input terminal connected to said control signal storage means and a second input terminal connected to said timing signal delay means, and having an output terminal for generating an enabling signal in response to the contents of said control signal storage means and said delayed timing signal,

iii. flip-flop means having a set and a reset condition for generating a control pulse signal,

iv. flip-flop control means connected to said enabling signal generating means and said flip-flop means for



generating a signal in response to said enabling signal that forces said flip-flop means to a set condition and a second signal that forces said flip-flop to a reset condition,

v. a plurality of control signal coincidence means each having an input terminal connected to receive said control pulse signal from said flip-flop means and a second input terminal connected to one of said bit enable storage means for receiving the bit enable data stored therein, each control signal coincidence means generating one of said internal bit operation control signals in response to said control pulse signal and the bit enable data stored in said bit enable storage means; and

F. random access memory means connected to said data input storage means, said address signal storage means, said control signal generating means and said data output storage means and including a plurality of addressable storge locations for receiving the internal memory operation control signal and for storing data received from said data input storage means at, or transmitting stored data from locations identified by an address from said address signal storage means in response to said internal memory operation control signal from said control signal generating means, each said storage location containing a prede-

termined number of bit locations each for storing a bit of data, said data comprising the same predetermined number of bits, and said random memory access means including:

1. bit enable terminal means for receiving bit enable signals each corresponding to one of said bit locations,
2. bit enable storage means connected to said bit enable terminals means and said timing signal terminal means for storing bit enable data representative of said bit enable signals at said bit enable terminal means in response to the receipt of said timing signal; said internal memory operation control signal comprising the same predetermined number of internal bit operation control signals and said control signals generating means further being connected to said bit enable storage means and generating said internal bit operation control signals in response thereto the bit enable data stored therein; and said random access memory means being responsive to said internal bit operation control signals for controlling the transmission or retrieval of data to or from correponding bit locations of said addressed location.

4,712,191

DISPLAY SYSTEM WITH NESTED INFORMATION DISPLAY

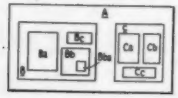
David E. Penna, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

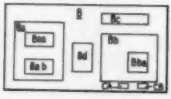
Filed Jul. 22, 1983, Ser. No. 516,020

Claims priority, application United Kingdom, Aug. 11, 1982, 8223085

Int. Cl.[4] G06F *3/14, 15/40;* G06G *1/06*

U.S. Cl. 364—900 **13 Claims**





1. An information display system comprising:

connection means for establishing selective connection between the display system and a number of different information sources to obtain information therefrom,

a display device for the display of information obtained from said information sources,

central processor means connected to said display device and said connection means for determining from which information source information is to be obtained and displayed,

interface apparatus connected to said central processor means and operating under user control to generate and apply to said central processor means signals representing any selected point on a display area of the display device, and

logic control means included in said central processor means causing the display on the display device of frames of available options which pertain to said information sources, said logic control means comprising:

(a) means for producing, on initialization, a first display frame defining at least two discrete areas which are identified as pertaining to different facility options assigned to said areas, said first display frame further defining within at least one of said discrete areas at least one discrete sub-area which is identified as pertaining to one or more further facility options assigned to said sub-area,

(b) means for producing a second display frame in response to the selection by said interface apparatus of a point which is within one of said areas but not within a sub-area of that area, said second display frame defining at least sub-areas which are identified as pertaining to different facility options assigned to said sub-areas, and

(c) means for producing a third display frame in response to the selection by said interface apparatus of a point which is within a sub-area, said third display frame defining at least two discrete sub-sub-areas within said sub-area which are identified as pertaining to different facility options assigned to said sub-sub-areas, and if said selected area or sub-area pertains to a single facility option, providing a visual indication of the selection of that facility option,

the logic control means then causing said central processor means to operate said connection means to establish connection to the information source pertaining to the selected facility option.

4,712,192

SEMICONDUCTOR MEMORY DEVICE AND FABRICATION PROCESS THEREOF

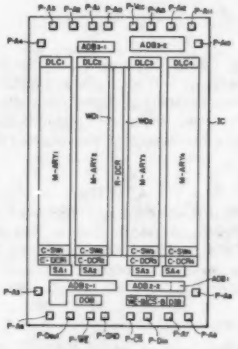
Nobuyoshi Tanimura, Musashino, and Tokumasa Yasui, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 341,623, Jan. 22, 1982. This application Oct. 4, 1985, Ser. No. 783,959

Claims priority, application Japan, Feb. 6, 1981, 56-15733

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—51 **19 Claims**



1. A semiconductor memory device having MIS transistors composing memory cells, the memory cells having load devices, the load devices being connected to a power supply line, and peripheral circuits having MIS transistors, with the gate of at least one of the MIS transistors of the peripheral circuit being connected, through a protection resistor, with a bonding pad, the memory device being fabricated by a process including the steps of:

forming a first film of an electrically conductive material, which serves as the gate of the MIS transistors composing memory cells of the semiconductor memory device, over a semiconductor material, said first film having a first resistivity;

forming an insulation film to cover the semiconductor material which is formed with each of the MIS transistors composing said memory cells; and

forming second films, which second films include a layer of polycrystalline silicon, which second films respectively serve as each load device of each of said memory cells, as a wiring for connecting the load device with a power

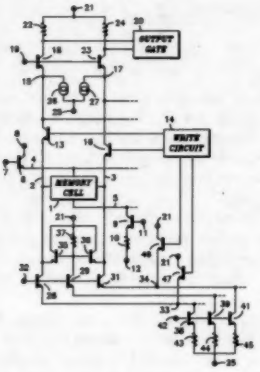
supply line and as the protection resistor through which the gate of at least one of the MIS transistors composing peripheral circuits is connected with the bonding pad, over said insulation film covering said semiconductor material, the resistivity of the second films serving as said protection resistor and as said wiring being lower than that of the second film serving as said load device and higher than that of said first film.

4,712,193

CURRENT STEERING DIFFERENTIAL WRITE CIRCUIT FOR MEMORY CELLS

Ira E. Baskett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 21, 1985, Ser. No. 800,240
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—190 **10 Claims**



1. A memory circuit having a read mode and a write mode, including a first voltage terminal and a second voltage terminal, said circuit comprising:

a word line;

a current drain line;

a first bit line;

a second bit line;

a memory cell coupled between said word line and said current drain line and coupled between said first and second bit lines;

first means coupled between said first voltage terminal and said first word line for selectively applying voltage to first word line;

second means coupled between said current drain line and said second voltage terminal for sinking current from said current drain line;

third means coupled to said first and second bit lines for sensing current in said first and second bit lines;

fourth means coupled to said first and second bit lines for enabling current through said first and second bit lines;

fifth means coupled between said second voltage terminal and both said first and second bit lines for sinking a read current through said first and second bit lines; and

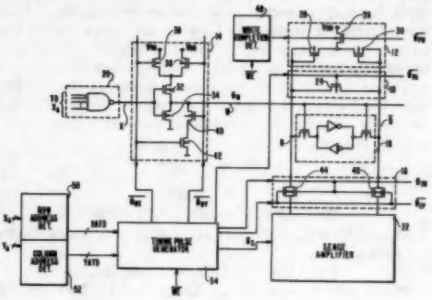
sixth means coupled between said first voltage terminal and said fifth means for supplying current to said fifth means when said memory cell is in said write mode.

4,712,194

STATIC RANDOM ACCESS MEMORY

Seiji Yamaguchi, Hirakata; Eisuke Ichinohe, Katano, and Johji Katsura, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 31, 1985, Ser. No. 739,875
Claims priority, application Japan, Jun. 8, 1984, 59-118481; Jul. 16, 1984, 59-148052; Aug. 18, 1984, 59-171940
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—203 **12 Claims**



1. A static random access memory comprising:

a first precharging means for precharging bit lines in response to a first input signal supplied thereto which occurs upon a detection of a change in an address input;

a second precharging means for precharging the bit lines in response to a second input signal supplied thereto which occurs upon a detection of the completion of a write operation,

a word line driving means for controlling a period in which a word line selected by a row decoder is selected in response to third and fourth input signals supplied thereto which respectively occur upon a detection of a change in at least one of a row address input and column address input; and

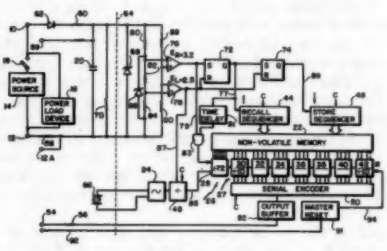
a bit line connecting means for coupling the bit lines and a sense amplifier for a specified period in synchronism with the operation of the sense amplifier, after the data of the memory cell selected in a read-out operation has been transferred to said bit lines.

4,712,195

SOLID-STATE CUMULATIVE OPERATIONS MEASUREMENT SYSTEM

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mt. Kisco, N.Y.

Filed May 9, 1986, Ser. No. 861,339
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—226 **26 Claims**



1. A cumulative operations measurement system for connection to a source of supply voltage and operable in response to

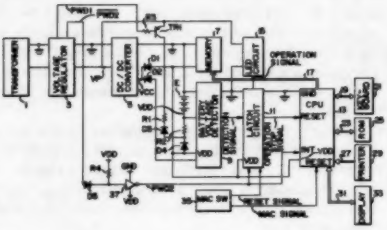
an operating voltage for accurately measuring a summation of the operations when that operating voltage is present, said system comprising a capacitor connected to be charged by the supply voltage, a volatile multiple-stage memory register connected to receive the operating voltage signals to be counted at the low order end thereof and operable to store said signals as a measure of total operations, a nonvolatile multiple-stage memory register having stages corresponding to at least some of the stages of said volatile memory register, means for detecting when the supply voltage is removed, a store sequencing means connected to be powered by the energy stored in said capacitor and connected to said last-named means and operable in response thereto to transfer the count stored in said volatile memory register into said nonvolatile memory register for storage therein, means for detecting when the supply voltage is applied. a recall sequencing means connected to said last-named means and operable in response thereto to transfer the count stored in said nonvolatile memory register into said volatile memory register.

4,712,196

DATA PROCESSING APPARATUS

Yoshinori Uesugi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,251
Claims priority, application Japan, Dec. 21, 1984, 59-268545
Int. Cl.[4] G11C *29/00*
U.S. Cl. 365—229 **18 Claims**



1. A data processing apparatus with a memory back-up system comprising:

data storing means for storing data;

data processing means, coupled to said data storing means, for processing data stored in said data storing means;

main power supply means for supplying electrical power to said data storing means and to said data processing means;

back-up battery means;

switching means coupled to said back-up battery means for supplying electrical power of said back-up battery means to said data storing means when the electrical power of said main power supply means is not supplied to said data storing means, and for immediately supplying the electrical power of said main power supply means to said data storing means when said power of said main power supply means can be supplied to said data storing means;

detecting means, separate from and operable independently of said data processing means, for detecting when an output voltage of said back-up battery means falls below a predetermined voltage level below which said back-up battery means is incapable of supplying sufficient output voltage to enable said data storing means to retain data when the power of said back-up battery means is supplied to said data storing means, and for outputting a detection signal indicating that said output voltage of said back-up battery means has fallen below said predetermined voltage level;

retaining means for receiving and retaining said detection signal from said detecting means; and

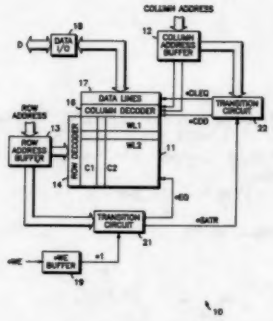
display means for producing a predetermined display in accordance with said detection signal of said retaining means when power is supplied from said main power supply means to thereby display that said voltage of said back-up battery means has fallen below said predetermined voltage value.

4,712,197

HIGH SPEED EQUALIZATION IN A MEMORY

Lal C. Sood, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1986, Ser. No. 823,446
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **20 Claims**



1. A memory having a write mode, indicated by a write enable signal being in a first logic state, for writing data into a selected memory cell via a selected bit line pair, and a read mode, indicated by the write enable signal being in a second logic state, for reading data provided onto a selected bit line pair, comprising:

a plurality of memory cells located at intersections of word lines and bit line pairs, each memory cell receiving data from or providing data to the bit line pair to which it is coupled when the word line to which it is coupled is enabled;

a row decoder, coupled to the word lines, for enabling a selected word line as determined by a row address;

equalization means, coupled to the bit line pairs, for equalizing the voltages on the bit line pairs in response to receiving an equalization signal; and

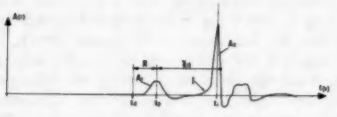
transition detection means for providing the equalization signal in response to either a transition of the write enable signal from the first logic state to the second logic state or a transition of the row address or both.

4,712,198

PROCESS FOR OPTIMIZING THE FREQUENCY SPECTRUM OF PULSES EMITTED BY AN EMISSION DEVICE COMPRISING SEVERAL SEISMIC IMPLOSION FORCES

Jean-Pierre Fail, Royan, France, assignor to Institute Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 17, 1985, Ser. No. 745,228
Claims priority, application France, Jun. 18, 1984, 84 09621
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—23 **3 Claims**



1. A process for optimizing the frequency spectrum of the

pulses emitted by an emission device formed by a plurality of seismic implosion sources and resulting from the combination of the individual pulses emitted by said implosion sources, each of said individual pulses comprising a precursion peak followed by an implosion peak, delayed by a pseudo-period with respect to the precursion peak, which precursion peak occurs a time lapse after tripping of the implosion source, said process comprising:

immersing the implosion sources at different selected depths, so as to give them distinct pseudo-periods;

determining the effective pseudo-period of each of the sources as a function of the selected depth to which the sources is immersed;

determining, for each of the sources, the propagation time interval of acoustic waves over the distance from a water surface to said source;

determining, as a function of said pseudo-period and of said respective propagation time intervals, and of said respective time lapse, time lags which should separate the tripping times of the sources for phasing the implosion peaks of the different pulses emitted after propagation, while keeping out of phase the precursion peaks of the different implosion sources, and

sequentially tripping said sources while utilizing the previously determined time lags, whereby the ratio of the amplitude of the resulting implosion peak to that of the whole of the precursion peaks is increased providing for an improved frequency spectrum.

4,712,199

PROCESS FOR CONTROLLING THE STORAGE OF DATA RECEIVED BY A SEISMIC RECORDING SYSTEM AND A DEVICE FOR IMPLEMENTING SAME

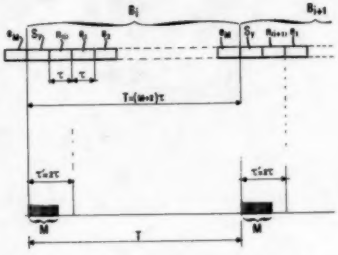
Joseph Rialan, Meudon, and Renate Bary, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 26, 1985, Ser. No. 801,764

Claims priority, application France, Nov. 30, 1984, 84 18424

Int. Cl.⁴ G01V *1/0*; G06K *5/00*

U.S. Cl. 367—76 **8 Claims**



1. A process for controlling storage by a recording system of signals derived from seismic signals emanating from subterranean discontinuities in response to waves generated by a seismic source, said seismic signals being received by sensors, and signals produced by said sensors being collected by a plurality of acquisition devices which operate to sample, digitize and store received signals in the form of a series of samples, each series of samples concerning the same signal and being associated with control signals for detection of possible transmission errors, the different series of samples stored respectively by the different acquisition devices being transmitted sequentially to the recording system, said process comprising:

subdividing each series of samples to be transmitted from an acquisition device into a plurality of blocks each containing an arbitrary number of samples which is the same for all the series, and forming a signal train for transmission in which each one of said blocks is separated from the other blocks by a timing signal and is provided with an identification signal defining its order number in the signal train;

transmitting a signal train from an acquisition device to said recording system;

first checking in said recording system for detection of the successive timing signals heading each block of a received signal train;

second checking in said recording system for detection of an identification signal associated with each block for which a timing signal has been detected to determine if a correct block has been received;

third checking in said recording system the number of samples in each received block for which the identification signal indicates that a correct block has been received;

validating blocks comprising a number of received samles greater that a given value as determined in said third checking; and

transferring each of the validated blocks to a position of a recording medium previously assigned to said block, whereby seismic traces corresponding respectively to the transmitted series can be plotted, respecting exact timing of reception.

4,712,200

DEVICE FOR PROCESSING MODULATED SIGNALS RECEIVED BY A LATERAL SONAR SYSTEM

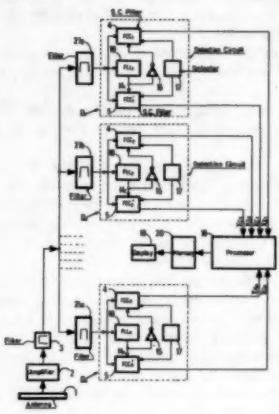
Jean-Pierre Cassou, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 8, 1985, Ser. No. 720,793

Claims priority, application France, Apr. 6, 1984, 84 05616

Int. Cl.⁴ G01S *9/66, 9/68*

U.S. Cl. 367—88 **8 Claims**



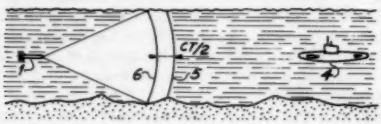
1. A device for processing amplitude and phase modulated signals received at each transmission-reception cycle by a side-looking sonar system, these signals being the echoes backscattered by the surface at the bottom of a mass of water of sound pulses transmitted from a vehicle carrying said sonar system, comprising: filtering means connected to receive said amplitude and phase modulated signals for selecting at least one frequency band in the frequency spectrum of the signals received; demodulation assembly means, including local oscillator means, for producing a reference signal and combination means for generating, from said received filtered signals and from the reference signal, signals corresponding to the quadrature components of the complex amplitude of the received signals; processor means for calculating said complex amplitude from its quadrature components; and display means for representing the variations of said complex amplitude, as a function of time, at each transmission-reception cycle; wherein said local oscillator means is included in a phase locked loop circuit connected to said filtering means whereby the frequency of said reference signal depends on that of the filtered signals irrespective of any Doppler shift affecting received signals.

4,712,201

ACOUSTIC SELF-GUIDANCE SYSTEMS FOR SUBMARINE VEHICLES

Michel Lagier, Paris, France, assignor to Thomson CSF, Paris, France

Filed Feb. 16, 1979, Ser. No. 22,115
Claims priority, application France, Feb. 17, 1978, 78 04526
Int. Cl.[4] G01S 9/66
U.S. Cl. 367—92 **11 Claims**



1. A self guidance system for a submarine vehicle moving toward a target near the surface of the sea and carrying a parametric sonar comprising:

means for transmitting sound waves

means for receiving sound waves reflected from a target

means for forming r receiving beams wherein $r \geqq 2$ in an angular aperture of bearing so as to define r sectors in said aperture,

means for forming $r \times q$ transmitting beams, wherein $q \geqq 2$ so as to define q subsectors in said r sectors

first generator means generating a main frequency F and second generator means generating q frequencies $F_1, F_2 \ldots F_i \ldots F_q$ said latter being called primary frequencies or high frequencies

switching means connected to said second generator means for selecting one of said primary frequencies $F_1, F_2 \ldots F_i \ldots F_q$,

a plurality of filtering means, each centered on one of secondary frequencies, such as $f_1 = F - F_1$, $f_2 = F - F_2 \ldots f_i = F - F_q$,

first clock generator means H_1 of period T_1, T_1 being the period of transmitting said main frequency

second clock generator means of period T_2, T_2 being the duration of transmitting at one of said primary frequencies, both said clock generator means controlling said first and second generator means

an adding circuit connected to said first and second generator means delivering to said transmitting beams forming means signals on said main frequency and on one of said selected primary frequencies, said transmitting beams forming means being controlled by said clock signals H_2, forming a beam in one of said $r \times q$ subsectors

said receiving means receiving sound waves reflected from a target on said secondary frequencies, being connected to said receiving beam forming means, latter being controlled by said clock signals H_2 and H_1, forming beams in one of said r sectors, said plurality of filtering means centered on each secondary frequency receiving the signals from said receiving beam forming means and at the output of said filtering means are obtained the q receiving channels called frequential channel for each of said sectors.

4,712,202

METHOD AND APPARATUS FOR CONVERTING AN AIR GUN INTO A HYDRO GUN FOR MARINE SEISMIC IMPULSE GENERATION

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Technolgy Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 579,389, Feb. 13, 1984, abandoned. This application Dec. 12, 1984, Ser. No. 680,733
Int. Cl.[4] G01V 1/14, 1/38
U.S. Cl. 367—144 **49 Claims**

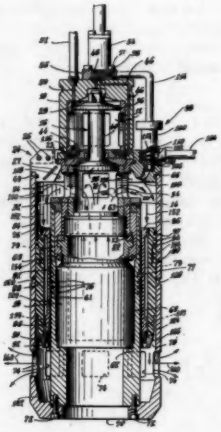
1. Apparatus for converting a submersible seismic source air gun of the type which includes elongated housing means having at least one air discharge port for impulsively discharging pressurized air therefrom in response to actuation of a firing means, into a hydro gun, which comprises:

annular cylinder head means mounted on said elongated housing means in a predetermined position near said air discharge port, said annular cylinder head means encircling said elongated housing means,

said predetermined position being on the upper side of said discharge port,

an elongated exterior cylinder secured to said annular cylinder head means and extending from said annular cylinder head means past said discharge port to a lower end of said elongated exterior cylinder remote from said annular cylinder head means,

said elongated exterior cylinder encircling said elongated housing means and being spacing outwardly away from said elongated housing means for defining an annular water cylinder space located between said elongated housing means and said elongated exterior cylinder,



said elongated exterior cylinder having at least two water ports therein communicating with said annular water cylinder space, said water ports being located near said lower end of said elongated exterior cylinder,

said annular water cylinder space having a closed lower end near said lower end of said elongated exterior cylinder,

a movable annular water piston located in said annular water cylinder space, annular water piston being movable between an upper position near said air discharge port and a lower position near said closed lower end of said annular water cylinder space, and

said air discharge port communicating with said annular water cylinder space in a regain between said annular cylinder head means and said annular water position for causing said annular water piston to move from said upper position to said lower position upon discharge of pressurized air through said air discharge port for expelling water from said annular water cylinder space through said water ports.

4,712,203

METHOD AND APPARATUS FOR THERMO MAGNETIC RECORDING/ERASING INFORMATION WITH PRESELECTED MAGNETIC FIELD SWITCHING

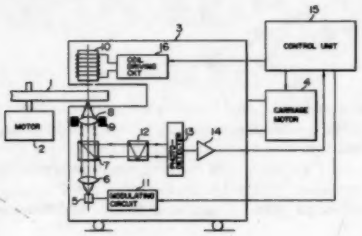
Atsushi Saito, Ichikawa; Masahiro Ojima, Tokyo; Takeshi Maeda, Kokubunji, and Tsuyoshi Kato, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,974

Claims priority, application Japan, Jun. 13, 1984, 59-120000

Int. Cl.[4] G11B *11/14, 13/04, 5/024*

U.S. Cl. 369—13 8 Claims



1. A method of processing information for a recording member having a recording film capable of recording and erasing information by changing the direction of magnetization of the recording film, in which recording and erasing operations are effected on the basis of a light induced thermo-magnetic effect, and in which reproducing operation is effected on the basis of a magneto-optic effect, comprising the steps of:

providing said recording member in the form of a disk having a plurality of tracks each corresponding to the circumference of said recording member formed on said recording member, each of said tracks being divided into a plurality of sectors, and each sector having a header portion for storing a header signal which includes a sector number for identifying the sector, and a data portion following said header portion for recording magnetization information;

focusing a laser beam on said recording film so that a light spot is formed on said recording film;

applying a magnetic field to said recording film;

changing the direction of said magnetic field at least between said recording operation and said erasing operation so that a magnetic field having a desired direction corresponding to an operation which is to be performed for a desired sector is applied to said recording film, the change of the direction of said magnetic field being effected when said light spot is positioned on a sector which precedes said desired sector by a predetermined number of sectors; and

changing the intensity of said laser beam into a first level capable of extinguishing the magnetization of said recording film so as to perform at least one of said recording and erasing operations when said light spot is positioned on said desired sector.

4,712,204

OPTICAL DISK AND METHOD FOR REPRODUCING REFERENCE SIGNAL THEREFROM

Yoshinari Takemura, Osaka; Kazuaki Obara, Kadoma, and Michiyoshi Nagashima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 23, 1985, Ser. No. 768,843

Claims priority, application Japan, Aug. 31, 1984, 59-181752; Dec. 7, 1984, 59-259478

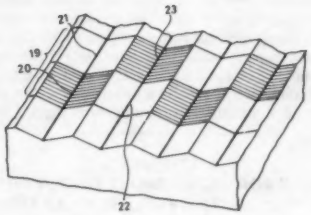
Int. Cl.[4] G11B *7/00, 27/10*

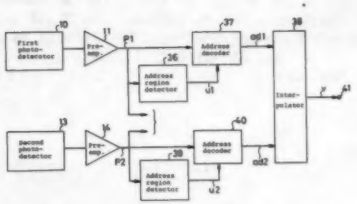
U.S. Cl. 369—32 9 Claims

1. An optical disk comprising:

a disk having grooves of helical or circular pattern thereon, each groove having a V-shaped cross-section,

a plurality of header regions on said grooves, each header region having a reference signal recorded in a groove in





the form of a changed depth portion across a width of said groove;

said changed depth portions being disposed so that changed depth portions of adjacent grooves are spaced apart from each other in a longitudinal direction of the grooves.

4,712,205

OPTO-ELECTRONIC FOCUSSING-ERROR DETECTION SYSTEM WITH A COMPOUND WEDGE BEAM SPLITTER

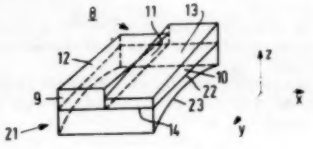
Albert Smid; Peter F. Greve, and Hendrik 't Lam, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,226

Claims priority, application Netherlands, Oct. 5, 1984, 8403034

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—45 17 Claims



13. An apparatus for reading and/or recording information arranged in tracks on a reflective surface of a record carrier, said apparatus comprising means for producing a beam of radiation, means for focusing said beam to a spot on said reflecting surface, a beam splitting element for splitting the radiation reflected by said reflecting surface into a pair of sub-beams and a detection system having a first and second pair of detectors, each detector being adapted to convert radiation incident thereon into an electrical signal and the detectors of each pair being spaced from each other so as to form an elongated separation strip therebetween, said detectors being arranged with respect to said beam splitting means so that each of said sub-

beams is incident on a respective one of said first and second pair of detectors with the intensity of the radiation incident on at least one of said detectors having a first value when said beam is focused properly on said reflecting surface and a second value when said beam is not properly focused on said reflecting surface, and means coupled to said detectors for deriving a focusing error signal from said electrical signals, said beam splitting element being configured so that temperature changes thereof cause the radiation of the respective sub-beam to move along the associated separating strip in the longitudinal direction thereof so as to reduce the effects of temperature changes on said focusing error signal.

4,712,206

TRACKING ERROR SIGNAL DETECTING DEVICE WITH A TWO-BEAM SYSTEM FOR USE IN AN OPTICAL INFORMATION MEMORY

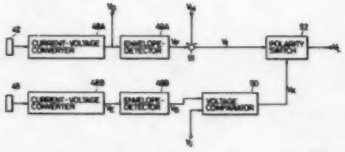
Shigeto Kanda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 574,061, Jan. 26, 1984, abandoned. This application Feb. 27, 1987, Ser. No. 20,175

Claims priority, application Japan, Jan. 31, 1983, 58-12652

Int. Cl.[4] G11B *7/09, 7/095*

U.S. Cl. 369—46 **5 Claims**



1. A tracking error signal detecting device for use in an optical information memory comprising:

means for applying a first light beam spot on a substantially central position of a track formed on an information carrying member and applying a second light beam spot on a position of said track which is spaced from the incidence position of the first light beam spot at least in a direction orthogonal to a direction of tracing of the track;

means for independently photoelectrically converting light beams obtained from said first and second light beam spots respectively and modulated by said track;

means for effecting envelope-detection with respect to outputs of said photoelectrically converting means to produce first and second detection signals;

means for obtaining a difference between said first detection signal and a pre-set first reference value signal to produce an error signal;

means for comparing said second detection signal with a pre-set second reference value signal to produce a polarity signal; and

means for changing over the polarity of the error signal in accordance with the polarity signal to derive a tracking error signal.

4,712,207

APPARATUS FOR ERASING INFORMATION ON A REVERSIBLE OPTICAL RECORDING MEDIUM

Charles W. Reno, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 18, 1985, Ser. No. 712,678

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—121 **14 Claims**

1. In an optical recording system for processing information on a surface of a record medium, said recording system including source means for providing a collimated light beam of generally circular cross-sectional shape; a beam expander positioned in the path of said collimated light beam for expanding said beam, said beam expander including input and output lenses; and an objective lens for focusing the beam passed by said beam expander to a generally circular diffraction spot on said surface of said record medium; an apparatus for elongating said generally circular diffraction spot focused on said record medium surface, said apparatus comprising:

means for anamorphically focusing a collimated light beam, said focusing means focusing a first aspect of a cross section of said collimated light beam at a finite distance f, and focusing a second aspect of said cross section orthogonal to said first aspect at an infinite distance; and

means for positioning said focusing means intermediate said source means and said beam expander at a distance f from the principal plane of said input lens of said beam expander.

4,712,208

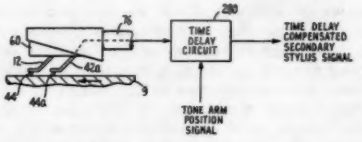
DISC REPRODUCING SYSTEM FOR COMPENSATING MECHANICAL IMPERFECTIONS

Ray M. Dolby, 50 Walnut St., San Francisco, Calif. 94118

Continuation-in-part of Ser. No. 5,992, Jan. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 859,799, Dec. 12, 1977, abandoned, and a continuation-in-part of Ser. No. 965,423, Dec. 1, 1978, abandoned. This application Feb. 2, 1981, Ser. No. 230,423

Int. Cl.[4] G11B *3/04*

U.S. Cl. 369—128 **30 Claims**



1. In a system for reproducing phonograph records having a movable tone arm carrying a cartridge and pickup stylus, having an arm-cartridge resonant frequency, for tracking the record groove, apparatus for deriving reference path information as to the vertical location of an unmodulated surface of the record in the vicinity of the pickup stylus comprising

means for sensing the vertical location of the movable tone arm to provide tone arm information which includes arm-cartridge resonant effects,

means for sensing the support arm to unmodulated record surface distance in the vicinity of the stylus to provide refernece path-arm information which includes arm-cartridge resonant effects,

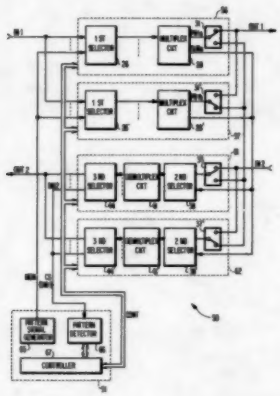
means for time delaying said reference path-arm information, and

means for combining said tone arm information and reference path-arm information out of phase to provide reference path information wherein arm-cartridge resonant effects are substantially reduced.

4,712,209
MONITORING APPARATUS CAPABLE OF MONITORING A DIGITAL EQUIPMENT BY THE USE OF A SYNCHRONIZATION SIGNAL

Kazushige Kuritani, and Tatsuhiko Nakagawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 10, 1985, Ser. No. 807,082
Claims priority, application Japan, Dec. 10, 1984, 59-260532
Int. Cl.[4] H04J 1/16, 3/12
U.S. Cl. 370—13 6 Claims



1. In a monitoring apparatus for monitoring digital equipment for multiplexing a plurality of input signals into a single output signal and for demultiplexing a single input signal into signal into a plurality of output signals, each of said plurality of input signals including an original synchronization signal of a predetermined pattern, said single input signal including an input synchronization signal of an input pattern, each of said plurality of output signals including an output synchronization signal of an output pattern into which said input pattern is demultiplexed, said monitoring apparatus circulating a monitoring signal through said digital equipment and receiving from said digital equipment a circulated signal which results from said monitoring signal, the improvement wherein said monitoring apparatus comprises:

signal generating means for generating as said monitoring signal a pattern signal identical with said predetermined pattern;

signal supplying means for supplying said monitoring signal to said digital equipment, wherein said digital equipment produces said circulated signal by forming a single path for said monitoring signal; and

monitoring means, connected to said signal supplying means, for monitoring said circulated signal to detect whether or not said circulated signal has said predetermined pattern.

4,712,210
SIGNAL CONVERSION CIRCUIT FOR INTERCONNECTING COAXIAL CABLE AND A TWISTED PAIR

Loren G. Davis, New Brighton; Steven R. Schmitz, St. Bonifacius, and Dennis L. Tauer, Jordan, all of Minn., assignors to Lee Data Corporation, Eden Prairie, Minn.

Filed Sep. 7, 1984, Ser. No. 648,061
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—77 19 Claims

1. An interface module for converting computerized data transmitted via coaxial cable to a different transmission format for transmission on a single communications medium other than coaxial cable, the interface module comprising:

at least one coaxial connection;

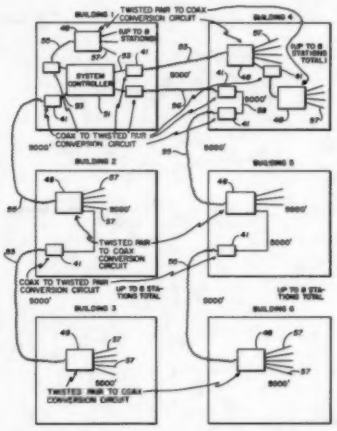
means for receiving the computerized data at high speed in a conventional bipolar coaxial format of the type having a positive pulse immediately followed by a negative pulse, the pulse width of the true state of the signal being twice as long in duration as the pulse width of the false state;

means for converting the computerized data to a bipolar digital format suitable for high speed transmission on the communications medium said bipolar transmission format being characterized by a first positive pulse followed nonsequentially by a second negative going pulse, the true and false state of the signals being determined by the time divided position of the negative going pulse;

means for transmitting the digital data on the communications medium in the converted format;

means for receiving data in the format transmitted on the communications medium;

means for converting the data from the format of the communications medium to the format suitable for high speed transmission on coaxial cable;



means for transmitting data in the conventional coaxial format suitable for transmission on the coaxial cable;

means for monitoring each data transmission and controlling the transmission means so that half duplex operation is achieved; and

means for monitoring the signal level of previous transmissions and controlling the gain of the received signal on the communications medium based on the signal level of the previous transmissions;

wherein at least one of the means for converting data comprises a bit latch connected to the received signal in the received format to determine whether a true state or a false state is to be transmitted in the converted format by at least one of the means for transmitting data.

4,712,211
NETWORK SYSTEM UTILIZING AN INTERMEDIATE SYNCHRONIZATIONS SIGNAL AND PREDETERMINED CODE STRING PATTERNS

Tadashi Suzuki, Yokohama; Kazuyoshi Okada, and Noriyuki Abe, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 5, 1986, Ser. No. 836,622
Claims priority, application Japan, Mar. 25, 1985, 60-58270; Mar. 25, 1985, 60-58271
Int. Cl.[4] H04J 3/06; H04L 7/00
U.S. Cl. 370—100 20 Claims

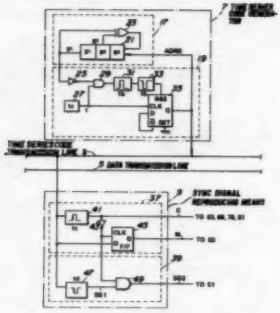
1. A network system having a plurality of interconnected data processing stations, comprising:

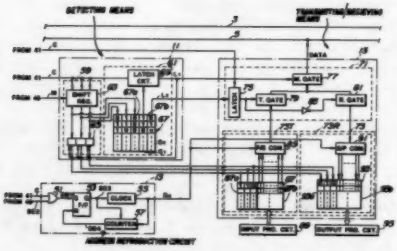
(a) first means for generating and transmitting a periodic first

pulse train signal according to a predetermined time series code string;

(b) second means for processing the first pulse train signal received from siad first means to form at least one intermediate synchronization signal and one of a plurality of predetermined code string patterns sequentially together with the synchronization signal during a time slot defining at least one code of the predetermined time series code;

(c) third means, including a data transmission and reception enable clock, for outputting a data transmission and reception enable clock signal whenever each time slot defining any one code of said predetermined time series code string is started, while correcting a frequency variation of said data transmission and reception enable clock by means of





said intermediate synchronization signal received from said second means:

(d) fourth means for determining whether one of said plurality of predetermined code string patterns received from said second means accords with a predetermined code indicating an address; and

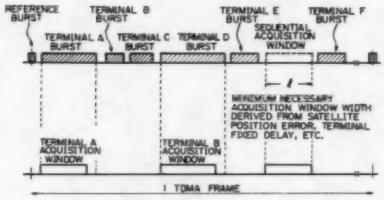
(e) fifth means for carrying out at least one of transmission and reception of a data of a predetermined number of bits in a Non-Return-To-Zero code in synchronization with said corrected data transmission and reception enable clock signal received from said third means depending on the contents of said predetermined address code when said fourth means determines that the one of said plurality of predetermined code string patterns accords with said predetermined address code.

4,712,212

TERMINAL CONTROL DEVICE FOR REFERENCE STATION IN TDMA SATELLITE COMMUNICATION SYSTEM

Haruki Takai; Mikio Ujiie, and Hideki Nakamura, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jan. 21, 1986, Ser. No. 820,602
Claims priority, application Japan, Jan. 24, 1985, 60-9815[U]
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—104 **1 Claim**


REFERENCE BURST
TERMINAL B BURST
TERMINAL E BURST
TERMINAL F BURST
TERMINAL A BURST
TERMINAL C BURST
TERMINAL D BURST
SEQUENTIAL ACQUISITION WINDOW
MINIMUM NECESSARY ACQUISITION WINDOW WIDTH DERIVED FROM SATELLITE POSITION ERROR, TERMINAL FIXED DELAY, ETC.
TERMINAL A ACQUISITION WINDOW
TERMINAL B ACQUISITION WINDOW
1 TDMA FRAME

1. A terminal control device for a TDMA satellite communication system which includes a reference station and a plurality of TDMA terminals and causing the reference station to perform regular synchronization control and initial acquisition control for each of the terminals, said device comprising:

a window information generator for generating information to select particular information and a particular acquisition mode responsive to a burst arrangement of the reference station and the terminals in a TDMA frame;

a regular window generator for generating information for providing a regular synchronization control window in each of regular synchronization positions of the respective terminals in the TDMA frame;

a parallel acquisition control window generator for generating information for providing an acquisition window particular to any one of the terminal sin an acquisition control position in the TDMA frame which is particular to said terminal;

a sequential acquisition control window generator for generating information for providing a common acquisition window in the TDMA frame which is shared by at least two of the terminals;

a window selector for selecting one of the informations which are representative of said three terminal control windows;

a burst receiver for receiving a burst which is sent from each of the terminals to detect a synchronizing code in the burst;

a receive timing generator for setting up a time reference for reception at the reference station responsive to a reference burst detection output which is produced by said burst receiver and, thereby, generating various timings which the device uses;

a burst detector for detecting whether or not a burst from any of the terminals has been received in any of the terminal control windows, and said burst detector further detecting burst position error information; and

a control information generator for generating control information for the terminals responsive to burst receive state information which is outputted by said burst detector.

4,712,213
FLIP STATUS LINE

Alastair A. Warwick, Gloucester, United Kingdom; David P. Schenkel, Ottawa, and Kenny Y. Ng, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 11, 1985, Ser. No. 807,600
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—15 **4 Claims**

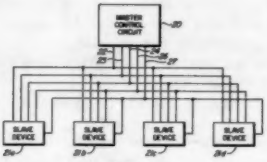


FIG. 1

STATUS BIT	FLIP LINE	SIGNIFICANCE
0	0	0 DOWN
1	0	0 WRITE
0	1	0 READ
1	1	0 UP
1	1	1 DOWN
0	1	1 WRITE
1	0	1 READ
0	0	1 UP

4. A method of verifying the operation of a device that is polled periodically, by a central control device, so as to report its current status, said method comprising the steps of:

(a) polling said device and recording a first response received from said device at a central control device;

(b) instructing said device to invert the bits in said first response to generate a second response to reply to a successive polling of said device; and

(c) polling said device and determining if said second response received from said device indicates that said device has inverted the bits of its second response in relation to said first response;

whereby a determination of the non-inversion of said bits in said second response in relation to said first response is indicative of either a fault condition or a device not present condition.

4,712,214
PROTOCOL FOR HANDLING TRANSMISSION ERRORS OVER ASYNCHRONOUS COMMUNICATION LINES

Clifford B. Meltzer, Peekskill; Krishnamurthi Kannan, Yorktown Heights; Thomas G. Burket, Pleasantville; Deborah J. Kruesi, Delmar, and Gordon W. Braudaway, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,699
Int. Cl.[4] G06F *11/10*; G08C *25/00*
U.S. Cl. 371—32 **20 Claims**

DATA PACKET AT LINK LEVEL

1	2	3	4	5,6	7	8	8+n	9,10+n	11+n
STX	ETX	ETX INV	SEQ NUM	BYTE COUNT	SEQ CNTL FLAG	CNTL FIELD	DATA BYTES	CHECK SUM	ETX
1	1	1	1	2	1	1	←n→	2	1

5. A method for detection of and recovery from transmission errors over asynchronous communication lines between transmitting and receiving stations, comprising the steps of:

producing the transmissions in packets containing n bytes, with the first byte in each packet being coded as a start-of-transmission character STX;

selecting an end-of-transmission character ETX for each packet after the data to be transmitted in the packet has been assembled, which ETX character is different from the remaining character codes in its respective packet and is made the second byte thereof;

making the third byte in each packet the complement of the ETX character selected for the respective packet;

making the bytes preceding the last three bytes in each packet data bytes;

making the next-to-last two bytes in each packet, checksum bytes;

making the last byte in each packet the same as the ETX character of the second byte to indicate the end of each packet, whereby the ETX character bytes are distinguishable from data bytes, and errors in either instance thereof are respectively checked by the third and second bytes in the packet, while data errors are checked by the checksums;

checking each packet for errors and halting transmission when an erroneous packet is detected;

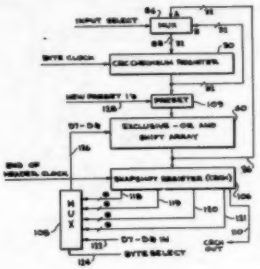
discarding packets found to be erroneous; and

after an erroneous packet is detected and discarded, using the unique combination of said first four bytes to detect the packet with the fourth byte next following that of the last correct packet in said transmission sequence to determine the point at which transmission is to be resumed.

4,712,215
CRC CALCULATION MACHINE FOR SEPARATE CALCULATION OF CHECKBITS FOR THE HEADER PACKET AND DATA PACKET

Sunil P. Joshi, Campbell, and Venkatraman Iyer, Berkeley, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1985, Ser. No. 803,367
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 **35 Claims**



16. An apparatus for calculating a first plurality of CRC bits on a header packet and a second plurality of CRC bits comprising:

CRC checksum register means for storing a plurality of bits of data present at a plurality of inputs upon receipt of a byte clock signal at a byte clock input and for presenting the stored data at a plurality of data outputs;

second means for receiving the data at said data outputs and for passing it through to a plurality of data outputs except when a NEW PRESET signal is in a predetermined logic state, at which time said data outputs are forced to a logic one state;

calculation means for receiving data bits from said second means and raw input data bits at a raw data input and shifting predetermined bits in a predetermined fashion while performing an exclusive-OR operation between predetermined bits during predetermined shifts with predetermined signals and presenting the results at a plurality of data outputs coupled to the data inputs of said CRC checksum register means;

a snapshot register having a clock input for receiving and END OF HEADER clock signal, and having a plurality of inputs coupled to said data outputs of said calculation

means and having a data output, said snapshot register for storing said first plurality of CRC bits upon receipt of said END OF HEADER clock signal;

a multiplexer having a first input coupled to said data output of said snapshot register and having a second input for coupling to a source of raw input data and having a data output coupled to said raw data input of said calculation means and having a control input for receiving a signal controlling which of said first or second inputs are to be coupled to said raw data input of said calculation means said calculation means for calculating said second plurality of CRC bits;

an input multiplexer having an output coupled to said data input of said CRC checksum register means and having a first input coupled to said data output of said calculation means and having a second input coupled to said data output of said CRC checksum register means and having a control input for receiving a signal controlling which of said first or second inputs is coupled to said data input of said CRC checksum register means.

4,712,216

METHOD AND DEVICE FOR CORRECTING ERRORS IN MEMORIES

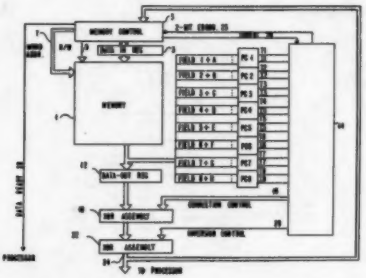
René J. Glaise, Nice, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,195

Claims priority, application European Pat. Off., Dec. 28, 1984, 84430046.7

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—38 **8 Claims**



1. Method for correcting errors in memories wherein the stored bits which may have a first or a second value ("1" or "0") are arranged in M-bit words, each word comprising an integer number D of data bits and an even integer number N of error correcting bits, with D+N=M, the data bits being partitioned into N fields comprising an even number of bits in such a way that an error correcting bit is associated to each field to indicate the parity of the associated field, the N fields with their associated error correction bits being used when a word is read from the memory to generate an N-bit error syndrome which contains an integer number n1 of bits at a first value ("1") to indicate a single bit in error, said number n1 being odd and such that N−n1=n2 is odd, and is different from n1 and an even number of bits at the first value ("1") different from N or 0 to indicate a two-bit error, said method being characterized in that:

in read mode, each word is read from the memory by performing the following steps:

reading the addressed word,

generating the error syndrome,

ending the reading operation if the error syndrome indicates that the read word contains no error or a single-bit error in which case if the error syndrome contains no bit at the first value ("1") meaning that there is no bit in error, the read word is ready to be used, if the error syndrome contains N bits at the first value ,

meaning that the word is stored in the inverted form and contains no bits in error, the read word is inverted before being delivered to the machine using the word, if the error syndrome contains n1 bits at the first value, the bit in error in the word is corrected and the corrected word is delivered to the machine, and if it contains n2 bits at the first value, which means that the word is stored in the inverted form and contains a single bit error, the bit in error is corrected and the read word is inverted before being delivered to the machine,

re-writing the inverted word if the error syndrome indicates a two-bit error,

reading the inverted word and generating the error syndrome of the inverted word,

reporting an uncorrectable error condition if the error syndrome of the inverted word indicates a two-bit error, or

ending the reading operation if the error syndrome of the inverted word contains no error or a single-bit error, in which case if the error syndrome contains no bit at the first value ("1") the read word is ready to be used, if the error syndrome contains N bits at the first value the read word is inverted before being delivered to the machine using the word, if the error syndrome contains n1 bits at the first value, the bit in error in the word is corrected and the corrected word is delivered to the machine, and if it contains n2 bits at the first value, the bit in error is corrected and the read word is inverted before being delivered to the machine.

4,712,217

SYSTEM FOR TRANSMITTING DIGITAL INFORMATION AND MAINTAINING A MINIMUM PAULSE DENSITY

Thomas R. McPherson, Redwood City, Calif., assignor to Network Equipment Technologies, Redwood City, Calif.

Filed Dec. 20, 1985, Ser. No. 811,914

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—55 **4 Claims**

1. In a communication system for transmitting a word organized, constrained data block over a communication channel, where each data word is an ordered set of bits with the first bit in the set denoted the least significant bit (LSB) with the communication system of the type including a communication channel and that requires a minimum pulse density to maintain an acceptable error rate, a system for maintaining a minimum pulse density comprising:

encoder means, adapted to receive a word organized ordered data block and coupled to the communication channel, for detecting critical words in said data block having all non-LSB bits equal to zero, where an all zero critical word has an LSB equal to zero, for forming an LSB word including the LSBs of said detected critical words, with the order of the bits in the LSB word corresponding to the order of the detected critical words in the data block, for forcing the original LSB of an all zero critical word to a one to form a constrained critical word, for forming a data frame including said LSB word and a constrained ordered data block identical to the received data block except that each all zero critical word is replaced by a constrained critical word, and for transferring said data frame to the communication channel; and

a decoder, coupled to the communication channel and

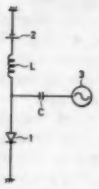
adapted to receive said data frame, for changing the LSB of each constrained critical word to a zero.

4,712,218

METHOD OF AND APPARATUS FOR DRIVING SEMICONDUCTOR LASER

Nobutaka Ohnuki, Ohta; Masahiro Ojima, Kokubunji; Akira Arimoto, Musashimurayama, and Naoki Chinone, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,871
Claims priority, application Japan, Mar. 18, 1983, 58-44230
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 15 Claims



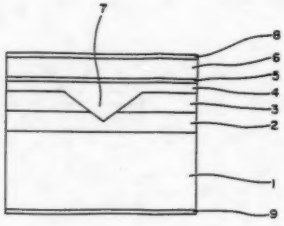
1. A method of driving a semiconductor laser to suppress laser noise caused by temperature change characterized in that the semiconductor laser oscillating in a single mode under direct-current drive is driven independently of said direct current drive by a signal with a high frequency current so that said high frequency current is superposed on said direct current, so as to bring said laser into continuous wave pulsed oscillation at a pulse width of at most 1.2 ns to suppress said laser noise caused by temperature change.

4,712,219

VISIBLE DOUBLE HETEROSTRUCTURE-SEMICONDUCTOR LASER

Seiki Yano; Saburo Yamamoto, both of Nara; Haruhisa Takiguchi, Osaka, and Shinji Kaneiwa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1985, Ser. No. 716,222
Claims priority, application Japan, Mar. 29, 1984, 59-62287
Int. Cl.[4] H01S *3/19*; H01L *33/00*
U.S. Cl. 372—45 11 Claims



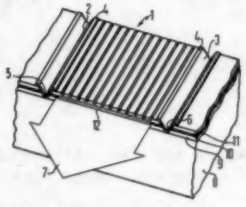
1. In a visible double heterostructure-semiconductor laser comprising:
- a substrate crystal of a first conductivity type;
- a first electrode formed under said substrate crystal;
- a first layer of a second conductivity type formed on said substrate crystal;
- a first cladding layer of the first conductivity type formed on said first layer;
- an active layer formed on said first cladding layer;
- a second cladding layer of the second conductivity type formed on said active layer; and
- a second electrode formed on said second cladding layer; the improvement wherein: said substrate crystal is a mixed crystal consisting of InGaAs, InAlP, InAlAs, InAlSb, or InGaSb;
- said first layer consists of the same mixed crystal as said substrate crystal; and
- the composition ratios of said substrate crystal and of each of said layers are selected such that the lattice constants of said substrate crystal and of said layers substantially coincide, an energy difference of 0.2 eV or more exists betwen the direct transition and the indirect transition within said active layer, and an energy difference of 0.2 eV or more exists between said active layer and either of said first and second cladding layers.

4,712,220

MULTIPLE LASER ARRANGEMENT

Johann Luft, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,860
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534912
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 28 Claims



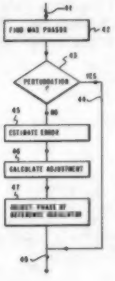
1. A multiple laser arrangement including a plurality of phase-coupled laser diodes with lateral extremities of the multiple laser arrangement characterized by a material for absorbing undesired transverse modes or ring modes is located at the lateral extremities of the multiple laser arrangement.

4,712,221

CARRIER RECOVERY OF MODULATED SIGNALS

Harold B. Pearce, and Lynn P. West, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1986, Ser. No. 901,901
Int. Cl.[4] H04B *1/16*
U.S. Cl. 375—14 11 Claims



1. A method for recovering the carrier of a modulated signal in a signal processing system, comprising:
- analyzing said modulated signal and determining a vector of maximum magnitude;

estimating a phase error from the difference between an angle of said vector and a predetermined angle; and,

adjusting the phase of a reference oscillator according to said estimated phase error for phase locking said modulated signal and said reference oscillator.

4,712,222

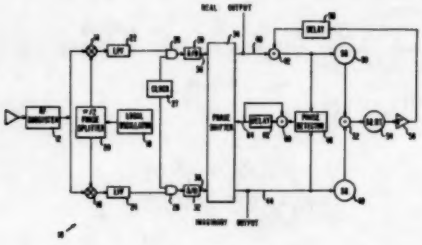
ADAPTIVE RECURSIVE PHASE OFFSET TRACKING SYSTEM

Charles M. Heard, Venice, and Frank C. Yang, Anaheim, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 328,178, Dec. 7, 1981, abandoned. This application Jun. 17, 1985, Ser. No. 745,814

Int. Cl.[4] H03D *1/24*

U.S. Cl. 375—77 **6 Claims**



1. An adaptive recursive phase offset tracking system for acquiring and tracking a received electromagnetic data signal comprising:

means for generating a complex baseband signal from the received signal;

means for sampling the baseband signal to derive a plurality of complex samples;

first filter means for deriving a track quality indication from the complex samples;

second filter means having a bandwidth controlled by the track quality indication for extracting a phase estimate from the complex samples; and

means for correcting the received data signal in response to the phase estimate to substantially compensate for a phase offset in the received data signal.

4,712,223

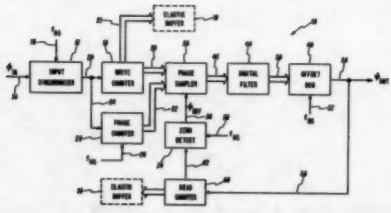
LINEAR ALL-DIGITAL PHASE LOCKED LOOP

Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,335

Int. Cl.[4] H03L *7/18;* **H04L** *7/02*

U.S. Cl. 377—43 **9 Claims**



1. A linear all-digital phase locked loop for providing an output signal comprising a stable reference clock signal from a gapped input clock signal, said digital phase locked loop comprising:

a digtally controlled oscillator means for genertng an output signal having a linear transfer function;

a read counter means operativley coupled to receive said output signal from said digitally controlled oscillator means, said read counter means being operatively configured to provide a sampling reference signal to said linear all-digital phase locked loop at a predetermined time;

an input synchronizer means operatively coupled to receive a gapped input clock signal and to synchronize said gapped input clock signal to a local high speed reference clock signal received by said input synchronizer means;

means for applying the gapped input clock signal to said input synchronizer means;

write counter means operatively coupled to receive the gapped input clock signal which is output from said input synchronizer means, said write counter means being configured to be incremented in count by the leading edge of each pulse of said received gapped input clock signal;

phase counter means operatively coupled to receive the gapped input clock signal which is output from said input synchronizer means, said phase counter means being configured to run at a predetermined higher frequency than said write counter means such that said phase counter means counts to a predetermined integer number for each normal count of said write counter means, said phase counter means being configured to being reset to zero by the leading edge of each pulse of saids gapped input clock signal;

sampling means operatively coupled to receive an output signal from said write counter means and an output signal from said phase counter means, said sampling means being configured to add said output signals together to provide a resulting signal upon receipt of said sampling reference signal output from said read counter means and to provide said resulting signal, in the form of a digital word with integer and fractional parts, as an input to said digitally controlled oscillator means.

4,712,224

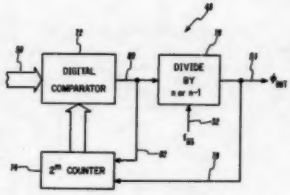
OFFSET DIGITALLY CONTROLLED OSCILLATOR

Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,343

Int. Cl.[4] H04L *7/02;* **H03L** *7/18*

U.S. Cl. 377—43 **8 Claims**



1. An offset digitally controlled oscillator for receiving an input signal representing a digital number and generating an output pulse signal having a linear transfer function, said offset digitally controlled oscillator comprising:

divider means operatively coupled to receive a reference clock signal of a predetermined frequency and structured to divide said reference clock signal by n and provide an output pulse signal for evewry n cycle of the reference clock signal;

counter means operatively coupled to receive said output pulse signal from said divider means and to provide an output signal representing the count in said counter means, said counter means structured to be incremented

by said output pulse signal received from said divider means;

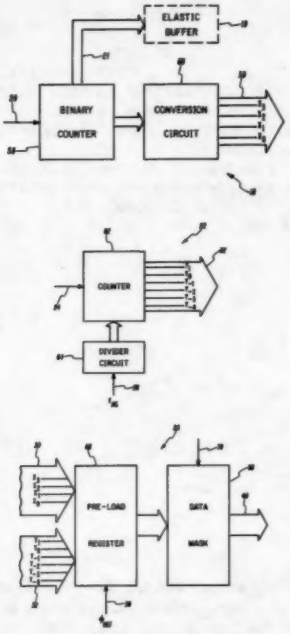
digital comparator means operatively coupled to receive the output signal from said counter means and operatively coupled to receive said input signal representing a digital number, said digital comparator means operatively coupled to provide an output signal to said divider means when said output signal from said counter means is at least equal to or greater than said input signal representing a digital number; and

said divider means being structured, when receiving said output signal from said digital comparator, to divide the reference clock signal by n−1 and to reset the counter means to zero.

4,712,225
PHASE QUANTIZER APPARATUS

Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1986, Ser. No. 917,344
Int. Cl.⁴ H04L *7/02*; H03L *7/18*
U.S. Cl. 377—43 **2 Claims**



1. Phase quantizer apparatus for use in an all digital phase locked loop in a digital communications network to provide a two-part digital number representing the phase of a noncontinuous pulse train input signal relative to an output signal of the all digital phase locked loop, said phase quantizer apparatus comprising:

a modulo m counter, said modulo m counter being structured to be incremented in count by the leading edge of each pulse in a noncontinuous pulse train input signal;

a modulo n counter, said modulo n counter being structured to be reset to zero by the leading edge of each pulse in the noncontinuous pulse train input signal; and

means for applying the noncontinuous pulse train input signal to said modulo m counter and said modulo n counter;

said modulo m counter being structured to perform two separate and distinct functions and to provide a first output signal and a second output signal, said modulo m counter being operatively coupled to apply said first output signal to an elastic buffer in a digital communications network to provide address information to the elastic buffer to read data into predetermined storage locations in the elastic buffer, said modulo m counter also being operatively coupled to apply said second output signal to means for combining, said second output signal being in the form of a two's complement code;

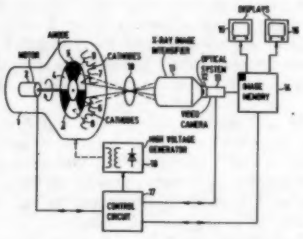
said modulo n counter being operatively coupled to receive the output signal from a high speed reference clock in the digital communications network, said modulo n counter being structured to divide said high speed reference clock signal such that the modulo n counter will count the number of cycles of the divided high speed reference clock signal between receipt of the leading edge of consecutive pulses of the noncontinuous pulse train input signal, said modulo n counter being structured to provide an output signal in the form of a digital count, said modulo n counter being operatively coupled to apply said output signal to said means for combining;

said second output signal from the modulo m counter is combined with the output signal from the modulo n counter in said means for combining to provide a representation of the phase of the noncontinuous pulse train input signal relative to the output signal of an all digital phase locked loop.

4,712,226
STEREOSCOPIC X-RAY TUBE

Heinz Horbaschek, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,081
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532822
Int. Cl.⁴ H01J *35/06*
U.S. Cl. 378—134 **7 Claims**



1. An x-ray system having a stereoscopic x-ray tube to direct x-rays toward an examination subject, said stereoscopic x-ray tube comprising:

an evacuated housing;

an anode dish disposed in said housing divided into at least one pair of segments of identical size, each segment in a segment pair emitting x-radiation, means for enabling only one segment in a segment pair to substantially emit x-radiation toward said examination subject;

at least two cathodes, wherein each cathode comprises a coil disposed in said housing, each coil having a focus associated therewith on said anode dish, the foci on said anode dish being spaced at a distance corresponding to an uneven multiple of the length of a track, which said focus would follow, within one of said segments; and

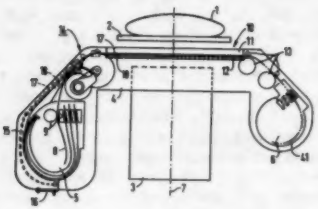
means for rotating said anode dish.

4,712,227

X-RAY FILM HOLDER AND METHOD OF OPERATING SAME FOR OPTIONAL FLUOROSCOPIC OR RADIOGRAPHIC EXAMINATION OF A PATIENT

Hans-Erik Warden, Upplands Vaesby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,451
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436427
Int. Cl.[4] G03B 42/02
U.S. Cl. 378—173 19 Claims



9. A film changer for an X-ray diagnostics installation for supporting an X-ray film sheet between overlapping screen foils in a first mode for generating a radiographic image of a subject on said film and for use with an X-ray image intensifier in a second mode for generating a fluoroscopic image of said subject comprising:

a recording unit disposed in front of said image intensifier and in which said film sheet is disposed for generating said radiographic image;

a film storage magazine disposed on one side of said recording unit and communicating therewith via a film track, said film storage magazine containing at least one unexposed X-ray film sheet;

a film take-up magazine disposed on an opposite side of said recording unit for receiving and storing exposed X-ray film sheets from said recording unit;

means for moving a film sheet from said storage magazine to said recording unit for radiographic exposure therein;

means for moving the exposed film sheet from said recording unit to said take-up magazine; a screen foil storage magazine disposed on said one side of said recording unit in which said screen foils are stored during said second mode;

means for automatically moving said foils from said foil storage magazine to said recording unit in said first mode with one of said foils crossing said film track;

means for automatically spreading said foils for receiving an unexposed film sheet therebetween via said film track from said film storage magazine; and

means for automatically returning said foils to said foil storage magazine after a radiographic exposure of said film.

4,712,228

DAYLIGHT X-RAY CASSETTE HAVING A WEIGHT TO IMPROVE FILM RELEASE

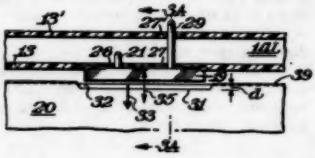
Van B. Johnson, Towanda, and Salvatore J. Nicosia, Athens, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 8, 1986, Ser. No. 850,601
Int. Cl.[4] G03B 42/04
U.S. Cl. 378—185 10 Claims

1. In an X-ray cassette having a frame with inner and outer sides, a pair of plates mounted on the frame oriented to receive a film sheet therebetween, at least one of the plates being moveable.

the cassette defining an opening along a first side of the frame for inserting and removing a film sheet relative to the plates, the improvement comprising:

a mass of at least 10 grams positioned within the cassette and movably secured to a second side of the frame opposite the first side, the mass being moveable from a second



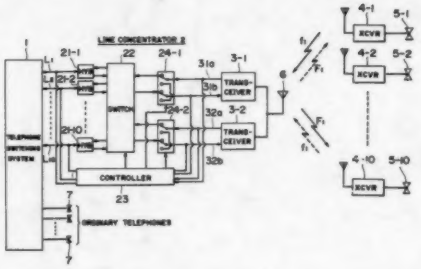
position away from a film sheet in the cassette to a first position closer to the first side opening to engage such a film sheet and under the influence of gravity to apply a force on such a film sheet in a direction to assist its departure from the cassette through the first side opening when said side opening is facing downwardly.

4,712,229

MULTIPLE ACCESS RADIO TELEPHONE SYSTEM SELECTIVELY OPERATING ON FULL-DUPLEX AND HALF-DUPLEX MODES

Hiroyasu Nakamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,400
Claims priority, application Japan, Mar. 26, 1986, 61-69279
Int. Cl.[4] H04Q 7/01
U.S. Cl. 379—58 12 Claims



1. A multiple access radio telephone system adapted to be connected to a telecommunication switching system which provides switched connections between subscriber line terminals thereof, comprising:

means for establishing M two-way radio channels;

a group of N remote stations having N corresponding subscriber line terminals in said switching system and being accessible to a selected one of said two-way radio channels, where N is greater than M; and

a concentrator connected to said switching system and said channel establishing means for selecting an arbitrary one of said two-way radio channels and establishing a full-duplex mode connection between a switched one of said corresponding subscriber line terminals and said selected two-way radio channel in response to a first call-processing signal and establishing a half-duplex mode connection between two of said remote stations through said selected two-way radio channel in response to a second call-processing signal.

4,712,230

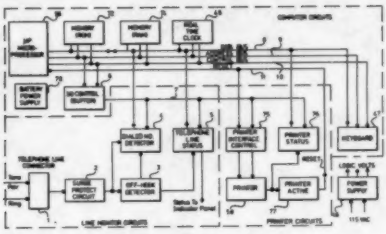
MONITORING AND RECORDING APPARATUS FOR CONNECTION TO A TELEPHONE LINE

John E. Rice, 3456 El Segundo Blvd., Hawthorne, Calif. 90250; James M. Rice, 510 Roosevelt Rd., Long Beach, Calif. 90807, and Robert W. Rice, 5068 Auburn Dr., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 671,688, Nov. 15, 1984, abandoned. This application Jun. 2, 1986, Ser. No. 869,350

Int. Cl.[4] H04M *15/04, 15/18, 15/22*

U.S. Cl. 379—112 5 Claims



1. An improved telephone monitoring and recording apparatus for the purpose of monitoring multiple or single telephones for both outgoing and incoming calls, and recording desired identification of the call number, its time, data and duration, said telephone monitoring and recording apparatus comprising:

(a) line monitor circuit means connected to the telephone line for sensing dialing, call start and completion and telephone status;

(b) computer circuit means for processing signals from said line monitor circuit means;

(c) printer circuit means operatively connected to said computer circuit means, for providing a record of telephone calling activities; and

(d) a power supply; said line monitor circuit means including a telephone line input connector, a surge protect circuit, an off-hook detector circuit, a dialed number detector circuit and a telephone line status circuit; said line monitor circuit being capable of continuously monitoring outgoing and incoming telephone calls and signals created by both tone and rotary pulse dialing telephone systems, without need of manual selection or switching.

4,712,231

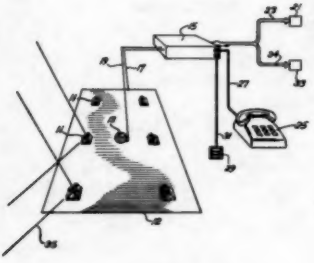
TELECONFERENCE SYSTEM

Stephen D. Julstrom, Evanston, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.

Filed Apr. 6, 1984, Ser. No. 597,734

Int. Cl.[4] H04M *1/60, 3/56*

U.S. Cl. 379—202 27 Claims



1. A teleconferencing system for use with at least one communication link and for use with at least one microphone which generates a microphone signal and for use with at least one loudspeaker for generating sound in response to a loudspeaker signal, comprising:

input/output means for receiving from a communication link a receive signal carrying a distant speech signal which represents distant speech occurring in time, and for sending a send signal onto a communication link;

microphone signal input means for receiving a microphone signal carrying a local speech signal which represents local speech occurring in time;

loudspeaker output means for passing a loudspeaker signal to a loudspeaker;

send mode/receive mode determining means for generating an electrical signal representative of a mode of suppression of either a send mode of suppression or a receive mode of suppression, said mode determining means detecting the occurrence of distant speech as represented by said distant speech signal carried by said receive signal and detecting the occurrence of local speech as represented by said local speech signal carried by said microphone signal, said determining means being responsive to the order in time of the detection of said distant speech and said local speech for generating said electrical signal representative of a said mode of suppression, said send mode/receive mode determining means including interrupt means for monitoring at least one occurrence within a predetermined time interval of both said local speech and said distant speech for switching said mode of suppression as represented by said electrical signal; and

variable gain circuitry means for generating said loudspeaker signal, said loudspeaker signal carrying said distant speech signal in response to said receive signal, said variable gain circuitry means for generating said send signal, said send signal carrying said local speech signal in response to said micrphone signal, said circuitry means including suppression means for controlling the gain of said loudspeaker signal and the gain of said send signal in accordance with the mode of suppression represented by said electrical signal.

4,712,232

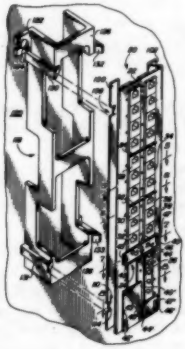
MULTIPLE TELEPHONE JACK SLIDE ASSEMBLY

E. Walter Rodgers, Glendale, Ariz., assignor to Armor Metals, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 839,740, Mar. 14, 1986, Pat. No. 4,658,418. This application Apr. 7, 1987, Ser. No. 35,517

Int. Cl.[4] H05K *5/00*

U.S. Cl. 379—329 10 Claims



1. A multiple telephone jack slide assembly for supporting a plurality of telephone jacks to be electrically interconnected with a wiring system, said assembly including:

(a) a sliding jack support member having at least one longitudinal channel formed therein, said channel being defined

by first and second generally opposing edge portions of said support member, said first and second generally opposing edge portions being separated by a predetermined distance generally corresponding to the width of said channel, said channel having an opening communicating therewith for permitting a telephone jack to be inserted into said channel;

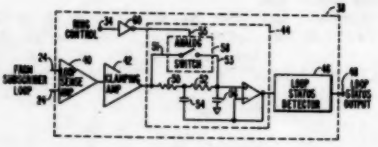
(b) a plurality of telephone jacks each having an upper surface opening into a cavity for releasably receiving a mating telephone cord plug, each of said telephone jacks further including a pair of opposing side walls extending downwardly from said upper surface and substantially perpendicular thereto, said opposing side walls being separated by a distance approximating the width of said channel, said opposing side walls including engaging means for slidingly engaging said first and second generally opposing edge portions of said channel for permitting each of said plurality of telephone jacks to be slid into said channel from the opening thereof in order to support said plurality of telephone jacks within said channel; and

(c) retaining means releasably fastened to said support member and abutting at least one of said plurality of telephone jacks for inhibiting further sliding movement of said plurality of telephone jacks after the same are slid into said channel.

4,712,233
MONOLITHIC TELEPHONE SUBSCRIBER LINE INTERFACE CIRCUIT

James R. Kuo, Cupertino, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Apr. 22, 1985, Ser. No. 725,461
Int. Cl.[4] H04M *3/22*
U.S. Cl. 379—386 **9 Claims**



1. In a supervision circuit of a subscriber line interface circuit coupled to a subscriber line and having a filter, the improvement comprising:

means for detecting dialing pulses with a predetermined positive—going threshold and a predetermined negative—going threshold of approximately one-half said positive—going threshold; and

a clamping amplifier for clamping positive—going signals on said subscriber line to approximately 1.5 times said predetermined positive—going threshold.

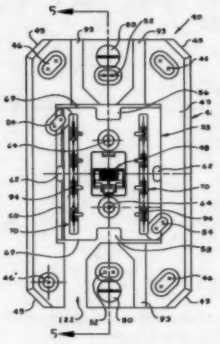
3. In a supervision circuit of a subscriber line interface circuit having means for detecting an off-hook condition of a subscriber and dialing pulses, the improvement comprising:

a programmable filter having a first mode for attenuation of a ringing signal and adaptable to a second mode, responsive to detection of said off-hook condition, for providing said dialing pulses to said detecting means without significant attenuation.

4,712,234
MULTI-PURPOSE MODULAR JACK CONNECTING BLOCK

Randy Below, Woodbury, Conn.; Howard Burke, Stone Mountain, Ga., and Stephen M. Thomas, Torrington, Conn., assignors to The Siemon Company, Watertown, Conn.

Filed Mar. 1, 1985, Ser. No. 706,971
Int. Cl.[4] H04M *9/00;* **H01R** *13/502, 13/66, 13/73*
U.S. Cl. 379—399 **42 Claims**



1. A modular jack connecting device comprising:

plate means, said plate means having a front face and a rear face;

at least one interior portion of said plate means being separable therefrom, said plate means having a central opening therethrough when said separable interior portion is separated from said plate means;

at least one modular jack connecting means attached to said separable interior portion of said plate means, said modular jack connecting means having an opening therein to permit access to a modular plug means, said opening being in said front face of said plate means; and

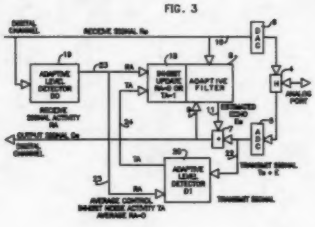
cover plate means for attachment to said separable interior portion subsequent to said separable interior portion being separated from said plate means, said cover plate means being disposed over said separable interior portion and having an opening therethrough in alignment with said modular jack connecting means opening.

4,712,235
METHOD AND APPARATUS FOR IMPROVED CONTROL AND TIME SHARING OF AN ECHO CANCELLER

Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,968
Int. Cl.[4] H04B *3/23*
U.S. Cl. 379—410 **8 Claims**

FIG. 3



1. An improved method of controlling coefficient calcula-

tion in an adaptive filter for an echo canceller comprising steps of:

detecting received signal activity in a first adaptive level detector;

providing an output signal from said first adaptive level detector indicative of detecting received signal activity therein;

detecting combined noise and transmitted signal activity in a second adaptive level detector connected to receive said output signal, having an adaptive threshold level whose adaptive threshold is enabled to adapt by said output signal from said first adaptive level detector, and

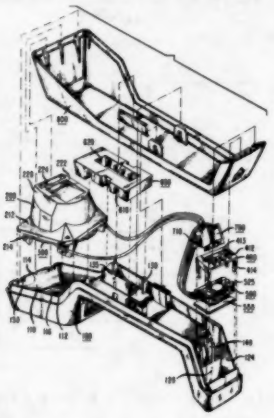
recomputing the coefficients in the adaptive filter when said first adaptive level detector indicates received signal activity and said second level detector indicates no combined noise and transmitted signal activity.

4,712,236

TELEPHONE HANDSET CONSTRUCTION

Reed S. Brown; John J. Consoli, both of Indianapolis, and Richard G. Klier, Greenfield, all of Ind., assignors to AT&T Information Systems Inc. American Telephone & Telegraph Company, Murray Hill, N.J.

Filed May 1, 1986, Ser. No. 857,865
Int. Cl.[4] H04R 1/03
U.S. Cl. 379—433 **7 Claims**



1. A telephone handset comprising:

a lower housing member having a pair of spaced transducer mounting positions;

an individual transducer mounting member associated with each transducer mounting position, each transducer mounting member being accommodated by the associated transducer mounting position and each transducer mounting member having an upper surface that includes a recess for accommodating a bonding material;

an individual transducer accommodated by each transducer mounting member and held in a transducer mounting position by the transducer mounting member in which it is accommodated; and

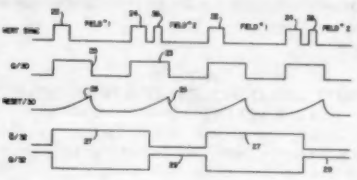
an upper housing member adapted to mate with the lower housing member to form a handset housing, the upper housing member having pair of spaced elements that respectively extend into the recesses in the upper surface of the transducer mounting members when the upper housing member is mated to the lower housing member, the upper housing member being secured to the lower housing member by the bonding material in the recesses.

4,712,237

METHOD AND APPARATUS FOR UNSCRAMBLING SYNC-SUPPRESSED TELEVISION SIGNALS

David L. Walker, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 29, 1984, Ser. No. 665,697
Int. Cl.[4] H04N 7/167
U.S. Cl. 380—15 **6 Claims**



1. In combination:

a television signal source of vertical sync signal including a field identifier in one of the fields;

sync signal detection means for producing different output signals corresponding to each field; and

timing signal generating means for generating timing signals for each field;

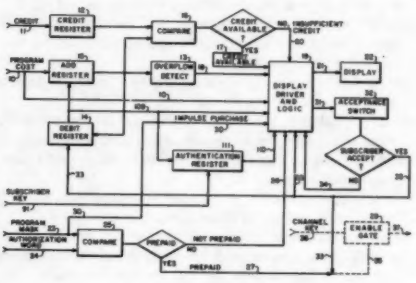
said timing signal generating means being coupled to said sync signal detection means and responsive to said output signals.

4,712,238

SELECTIVE-SUBSCRIPTION DESCRAMBLING

Klein S. Gilhousen; Jerrold A. Heller; Michael Van Harding, all of San Diego, and Robert D. Blakeney, II, Del Mar, all of Calif., assignors to M/A-COM Government Systems, Inc. and Cable/Home Communication Corp., both of San Diego, Calif.

Filed Jun. 8, 1984, Ser. No. 618,917
Int. Cl.[4] H04N 7/167, 7/00; H04L 9/00
U.S. Cl. 380—20 **6 Claims**



1. In a subscriber communication network a system for verifying charge information furnished to a broadcast company by a given subscriber and purported by the subscriber as having been displayed at the subscriber terminal, comprising

means at the subscriber terminal for providing a debit signal indicating the charges attributed to the subscriber terminal;

means at the subscriber terminal for processing the debit signal to provide an authentication signal;

means at the subscriber terminal responsive to the debit signal for providing to the given subscriber a display of information indicating the charges; and

means at the subscriber terminal responsive to the authentication signal for providing to the given subscriber a display of information representative of the authentication signal; and

means at the broadcast company for entering information furnished by the given subscriber that purportedly is the displayed charges information and the authentication information and for converting the same into a received debit signal and a received authentication signal respectively; and

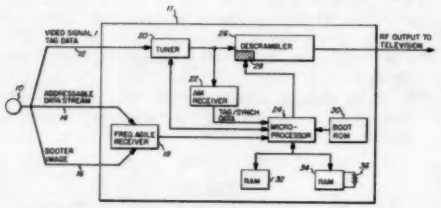
means for processing the received debit signal with the received authentication signal to determine whether the information furnished by the given subscriber was authentic.

4,712,239

SECURITY ARRANGEMENT FOR DOWNLOADABLE CABLE TELEVISION CONVERTERS

William Frezza, Warminster; Robert Simons, Lansdale, and Richard Westerfer, Norristown, all of Pa., assignors to General Instrument Corporation, New York, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,845
Int. Cl.[4] H04N 7/167; H04L 9/00
U.S. Cl. 380—20 **11 Claims**



1. Apparatus for preventing unauthorized receipt of programming in a downloadable cable television converter comprising:

receiver means for receiving data downloaded via a cable televison network;

means for automatically tuning said receiver means to a dedicated booter channel for receipt of data comprising a booter image when said converter is powered up;

means for subsequently tuning said receiver means to a separate channel for receipt of additional data after receipt of said booter image;

means for computing a booter checksum from data contained in said booter image;

means, coupled to receive a program signal, for extracting a valid checksum from tag data associated with said signal;

means for comparing the booter checksum to said extracted valid checksum;

a descramber coupled to receive at least a portion of said program signal to be descrambled; and

means operatively associated with said descrambler for enabling the descrambler to operate only if said comparing means determines that the booter checksum matches the extracted valid checksum.

4,712,240

TRANSMISSION AND RECEPTION OF TELEVISION BROADCAST IN HIGH-FIDELITY STEREO AUDIO

Thomas G. Schnerk, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 26, 1986, Ser. No. 878,735
Int. Cl.[4] H04H 5/00; H04N 7/04
U.S. Cl. 387—3 **6 Claims**

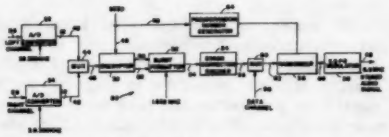
1. A method for transmitting a stereo audio signal within the bandwidth limitations of conventional television transmission systems, comprising the steps of:

digitizing the left and right channels of the stereo audio signal at a sampling rate of approximately 39.335 KHz to generate five audio samples during each horizontal line of a video signal;

multiplexing the left and right digitized audio samples to form a serial bit stream of audio samples;

encrypting the serial bit stream of audio samples;

bursting out the serial bit stream of audio samples at a higher data rate to allow for the insertion of other data into the serial bit stream;



encoding the serial bit stream of audio samples for error correction;

randomizing the serial bit stream of audio samples;

modulating the serial bit stream of audio samples with a 3-level, partial response waveform to form a modulated stereo audio signal; and

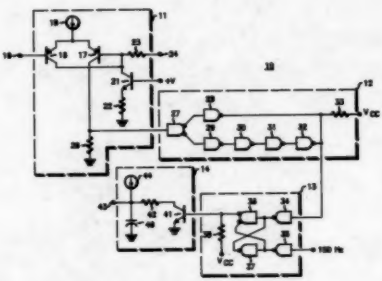
transmitting the modulated stereo audio signal.

4,712,241

BROADCAST SIGNAL DETECTED INDICATION SYSTEM

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1986, Ser. No. 902,860
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—15 **10 Claims**



1. In a radio having means for discretely receiving viable broadcast signals at a plurality of different frequencies and for locking onto one of said signals at a specific frequency to provide an output signal related to said signal, wherein:

said output signal will typically include both negative and positive polarity components when said radio has not locked onto one of said viable broadcast signals; and

said output signal will typically include only constant polarity components when said radio has locked onto one of said viable broadcast signals;

a broadcast channel indication system comprising detection means for providing a trigger signal whenever said output signal has a polarity component opposite in polarity from said constant polarity.

4,712,242

SPEAKER-INDEPENDENT WORD RECOGNIZER

Periagaram K. Rajasekaran; George R. Doddington, both of Richardson, and Thomas B. Schalk, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

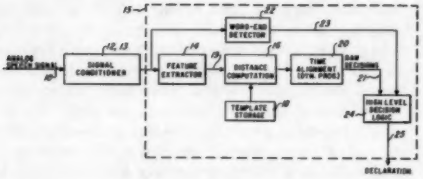
Filed Apr. 13, 1983, Ser. No. 484,730
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—42 **16 Claims**

1. A word recognition system for identifying a spoken word

represented by an analog speech signal, said word recognition system comprising:

signal processing means for receiving an analog input speech signal and for producing feature vectors from the input speech signal to provide a sequence of feature vectors at predetermined speech frame intervals as an output therefrom;

memory means storing a plurality of reference templates of digital speech data respectively representative of individual words and comprising the vocabulary of the word recognition system, each of said reference templates being defined by a predetermined plurality of reference vectors arranged in a predetermined sequence and comprising an acoustic description of an individual word in a time-ordered sequence, each of said reference templates being further defined by at least one mask vector respectively associated with each said sequence of reference templates being further defined by at least one mask vector respectively associated with each said sequence of reference vectors and being indicative of the significance of portions of the reference vector sequence association therewith in establishing the identity of the word represented by the reference template of which said at least one mask vector is a component;



means operably associated with said signal processing means for comparing each feature vector of said input speech signal with the corresponding reference vectors of each of said reference templates to provide a distance measure with respect to each of the feature vectors and the predetermined reference vector sequences defining acoustic descriptions of the respective words included in the vocabulary of the word recognition system, said comparing means being responsive to the status of the respective mask vectors comprising components of said plurality of reference templates to ignore elements of reference vectors included in respective reference templates which are indicated by the associated mask vector to be insignificant so as to provide said distance measure based upon significant elements of the reference vectors as included in the predetermined reference vector sequences; and

word recognizing means operably associated with said comparing means for determining which one of the plurality of the reference templates is the closest match to said input speech signal based upon the distance measures of said reference vector sequences and successively received feature vectors corresponding to respective speech frames.

4,712,243

SPEECH RECOGNITION APPARATUS

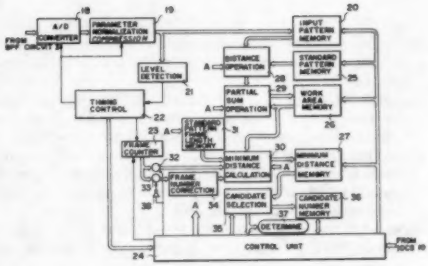
Masao Ninomiya, Akishima; Susumu Takashima, Kodaira; Kazumasa Fukushima, Ichikawa; Masami Yuyama, and Kazuyuki Kurosawa, both of Hamuramachi, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,279

Claims priority, application Japan, May 9, 1983, 58-80437; May 9, 1983, 58-80438; May 9, 1983, 58-80435; May 9, 1983, 58-80436

Int. Cl.⁴ G10L 5/00

U.S. Cl. 381—43 **10 Claims**



1. A speech recognition apparatus comprising:

conversion means for converting input speech signals to digital data;

first memory means coupled to said conversion means the digital data output of said conversion means;

second memory means for storing a plurality of standard patterns, each of said standard patterns comprising a plurality of component data;

first operation means for performing a dynamic programming operation on some of the digital output data of said conversion means and on said standard patterns;

candidate selection means coupled to said first operation means for selecting a predetermined number of candidates closest to said input speech signals based on the operation result of said first operation means;

second operation means for performing a dynamic programm operation on said standard pattern data corresponding to said candidate selected by said candidate selection means and on data stored in said first memory means; and

control means coupled to said first and second memory means and including means for coupling only some of the component data of at least some of the standard patterns stored in said second memory means to said first operation means at a predetermined cycle period, and for coupling some of the data stored in said first memory means to said first operation menas at a predetermined cycle period, and means for applying all of said stored data of said first memory means and all of the components of that standard pattern data of said second memory means which corresponds to the candidate selected by said candidate selection means, to said second operation means.

4,712,244

DIRECTIONAL MICROPHONE ARRANGEMENT

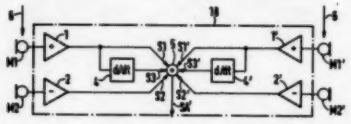
Eberhard Zwicker, Icking; Thomas Beckenbauer, Muenchen, and Guenther Beer, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 918,497

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536885

Int. Cl.[4] H04R *25/00, 1/20, 1/04*

U.S. Cl. 381—68.1 **25 Claims**



1. A directional microphone system comprising:

a plurality of non-directional microphones each having an electrical output;

means for deriving first and second electrical signals which are 180° out of phase with respect to each other from respective outputs of said plurality of microphones;

means for deriving through differentiation a third electrical signal from one of the outputs of said plurality of microphones which is 90° out of phase with respect to one of said first or second signals; and

means for summing said first, second and third electrical signals thereby forming an output signal for said system.

4,712,245

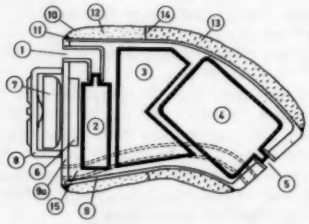
IN-THE-EAR HEARING AID WITH THE OUTER WALL FORMED BY RUPTURING A TWO-COMPONENT CHAMBER

Poul E. Lyregaard, Vaerlose, Denmark, assignor to Oticon Electronics A/S, Snekkersten, Denmark

Filed Jan. 24, 1985, Ser. No. 694,286

Int. Cl.[4] H04R *25/02, 31/00;* **B29B** *7/00;* **B29C** *33/40*

U.S. Cl. 381—68.6 **3 Claims**



1. A device for improving the hearing of the wearer comprising an electroacoustic cartridge, said cartridge having ends, said cartridge being constituted by means for transducing sound to an electrical signal, means for processing said electrical signal, means for powering and regulating said processing means, and means for transducing the processed electrical signal into sound, a casing enclosing said electroacoustic cartridge, said casing being adapted for insertion into the ear canal of the wearer, an elastic layer surrounding said casing, said elastic layer having ends, the ends of said layer being sealed to the ends of said cartridge, said layer together with said casing defining a closed chamber, said chamber containing a cold-curing composition consisting of at least two components, at least one partitioning wall within said chamber for separating said components one from the other, said partitioning wall being adapted to be ruptured when subjected to pressure, said components being adapted, when being combined upon rupture of said wall, to provide a composition which expands during an initial curing period, and then sets rigidly with a substantial form stability.

4,712,246

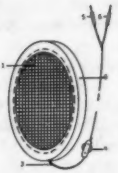
PUPPET SPEAKER

Alberta J. Morrison, P.O. Box 246, Eureka, Nev. 89316

Filed Dec. 14, 1984, Ser. No. 681,894

Int. Cl.[4] G06F *3/02*

U.S. Cl. 381—77 **1 Claim**



1. A speaker apparatus for use in a hand puppet comprising:

a speaker of a size capable of being held in one palm of a person while operating a hand puppet,

a housing for said speaker comprising padding means covering the rear side of said speaker, a fabric material covering said padding means, and a semi-rigid, audio-transparent plastic grill attached to said speaker and covering the front side of said speaker,

a four-wire telephone cable having a first two wires connected at a first end of said cable to input connectors of said speaker, a second two wires of said cable being connected at the first end of said cable to an in-line rotary on/off switch, the first two wires being connected at a second end of said cable to a miniature plug for connection to the audio output of an audio signal source and said second two wires being connected at said second end of said cable to a subminiature plug for connection to a remote control port of said audio signal source.

4,712,247

ELECTRO-ACOUSTIC SYSTEM HAVING A VARIABLE REFLECTION/ABSORPTION CHARACTERISTIC

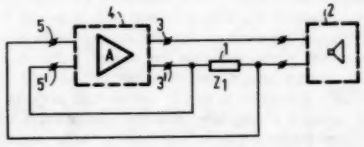
Petrus A. Swarte, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,774

Claims priority, application Netherlands, Apr. 3, 1984, 8401041

Int. Cl.[4] H04R *3/00*

U.S. Cl. 381—96 **23 Claims**



1. An electro-acoustic apparatus comprising: an audio amplifier having first and second signal input terminals and first and second signal output terminals, an electro-acoustic transducer unit which, in normal operation of the electro-acoustic apparatus, operates as both a loudspeaker and a microphone for the electro-acoustic apparatus, a first impedance, means connecting the first impedance and the transducer unit in series circuit to said first and second amplifier output terminals, and means

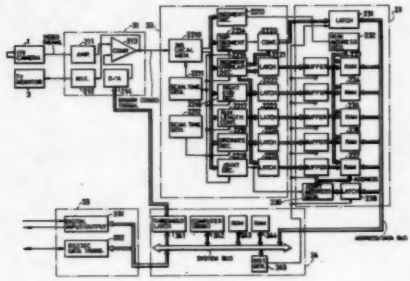
coupling said amplifier first and second input terminals across said first impedance so that a signal developed across said first impedance serves as the sole input to said amplifier whereby the electro-acoustic apparatus can alter at least one acoustic property of a space as a function of the amplifier gain and/or the impedance value of said first impedance.

4,712,248

METHOD AND APPARATUS FOR OBJECT IDENTIFICATION

Yasuo Hongo, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kawasaki, Japan

Continuation of Ser. No. 716,690, Mar. 27, 1985, abandoned. This application Apr. 3, 1987, Ser. No. 33,889
Claims priority, application Japan, Mar. 28, 1984, 59-58472
Int. Cl.[4] G06K *9/48, 9/46*
U.S. Cl. 382—22 3 Claims



1. An apparatus for identifying an object from a video signal representing an image of the object, the apparatus comprising:

feature data extracting means for converting the video signal into boundary gradient and contour data representing the boundary of the object;

means, coupled to said feature data extracting means, for processing said boundary gradient and contour data to identify abrupt changes in the gradient of the boundary of the object as a series of object points;

means for generating primitive element data associated with each of a plurality of segments singly disposed between adjacent ones of said object points on the boundary of the object and distance map data associated with said primitive element data to represent the positional relationships of each of said segments with respect to said object points in the boundary of the object, said primitive element data comprising characteristic data to identify said associated segment as (1) a straight line, (2) a circle or circular arc, or (3) an ellipse or an elliptical arc;

dictionary memory means for storing reference primitive element data and reference distance map data associated with a plurality of known, reference objects, said reference primitive element data including reference characteristic data identifying the contour of said associated reference object as one reference segment or a combination of reference segments wherein each reference segment comprises (1) a straight line, (2) a circle or circular arc, or (3) an ellipse or elliptical arc, said reference distance map data representing the positional relationships of each reference segment in the boundary of a reference object; and

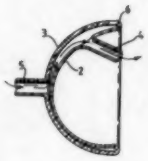
means, coupled to said processing means, said generating means, and said dictionary memory means for correlating said primitive element data and said distance map data associated with the object and said reference primitive element data and said reference distance map data associated with said reference objects and stored in said dictionary memory means to identify the object as the one of said reference objects with the greatest correlation with the object.

4,712,249

VALVES

Raymond Gannon, London, United Kingdom, assignor to FGL Projects Limited, London, United Kingdom

Filed Feb. 10, 1986, Ser. No. 828,057
Claims priority, application United Kingdom, Feb. 12, 1985, 8503545; Oct. 30, 1985, 8526700
Int. Cl.[4] B65D *33/24*
U.S. Cl. 383—43 8 Claims



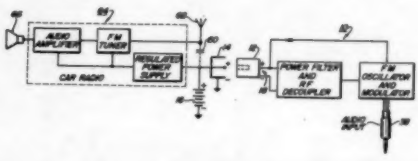
1. A valve for use in the packaging of perishable goods comprising a chamber having two walls and an inlet and an outlet disposed obliquely with respect to each other on either of the walls and one of the walls being deformable resiliently in the direction of the other wall and when deformed the deformable wall enters into such close intimate contact with other wall that communiction between the inlet and the outlet within the valve is prevented.

4,712,250

TAPE PLAYER ADAPTER FOR CAR RADIO

Dennis Michels, New York; Geoff Howe, Brooklyn, and Douglas Joseph, Neponsit, all of N.Y., assignors to Sound Sender, Inc., East Hanover, N.J.

Filed Aug. 12, 1985, Ser. No. 764,786
Int. Cl.[4] H04B *7/14, 1/34*
U.S. Cl. 455—20 12 Claims



1. A device for coupling an audio signal from an external source to an automobile radio, said radio including an antenna, an input stage, and an output stage having a loud speaker, and a connection to the automobile source of direct voltage, comprising:

input means for connection to said audio signal source;

output means for coupling an output signal to said radio input stage and for connecting said device to said direct voltage source;

a modulator-oscillator stage;

filter means connected to said output means and direct voltage source for providing a filtered direct voltage to operate said modulator-oscillator stage;

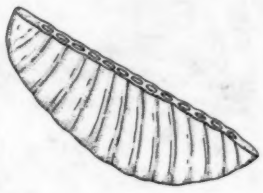
signal coupling means for applying said audio signal from said input means to said modulator-oscillator stage;

feedback means for causing radio frequency oscillation in said modulator-oscillator stage;

tuning means for establishing a selected frequency of said oscillation, said oscillation frequency being modulated by said audio signal to provide an output signal; and

means for connecting said output signal via said output means to apply said output signal to said radio to be heard over said radio loud speaker.

293,040
MEAT PRODUCT
Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Southdown Meat Company, Inc., West Chester, Pa.
Filed Feb. 8, 1985, Ser. No. 699,610
Term of patent 14 years
U.S. Cl. D1—125



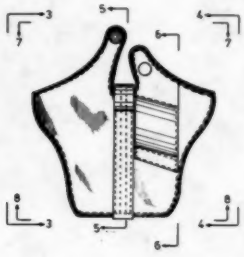
293,041
MEAT PRODUCT
Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Southdown Meat Company, Inc., West Chester, Pa.
Filed Feb. 8, 1985, Ser. No. 699,752
Term of patent 14 years
U.S. Cl. D1—199

293,042
HIGH HEEL PROTECTOR
Iris M. Martin, 9 E. Red Oak Dr., Voorhees, N.J. 08043
Filed Aug. 9, 1985, Ser. No. 764,206
Term of patent 14 years
U.S. Cl. D2—314

293,043
HAT RETAINING LEASH
William C. Zamboni, 16661 Bolero La., Huntington Beach, Calif. 92649
Filed Feb. 25, 1985, Ser. No. 705,134
Term of patent 14 years
U.S. Cl. D2—624

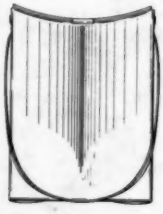
293,044
CAPPED CASE FOR HOLDING AND TRANSPORTING A CARPENTER'S LEVEL
Robert A. Johnson, Mequon, Wis., assignor to Johnson Level & Tool Mfg. Co., Inc., Milwaukee, Wis.
Filed Oct. 18, 1984, Ser. No. 662,990
Term of patent 14 years
U.S. Cl. D3—30.1

293,045
HOLSTER PRODUCTION BLANK
Michael T. Merritt, and James M. Kelly, both of 692 S. Main St., Moab, Utah 84532
Filed Feb. 19, 1985, Ser. No. 702,796
Term of patent 14 years
U.S. Cl. D3—101

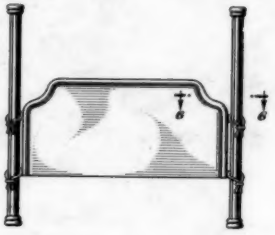


293,046
CHILD'S SWING
Merry S. Riehm, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 2, 1985, Ser. No. 762,119
Term of patent 14 years
U.S. Cl. D6—347

293,047
COMBINED SEAT AND CONTAINER
John W. Highfield, Heath, Ohio, assignor to Zenith Enterprises, Inc., Columbus, Ohio
Filed May 9, 1985, Ser. No. 732,270
Term of patent 14 years
U.S. Cl. D6—335

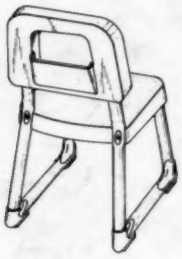


293,048
HEADBOARD FOR A BED
Phylliss B. Mann, Los Angeles, Calif., assignor to Cal-Marble Furniture Manufacturing Corporation, Los Angeles, Calif.
Filed Jul. 14, 1986, Ser. No. 885,267
Term of patent 14 years
U.S. Cl. D6—505



293,049
CHAIR
Peter Opsvik, Hogtunveien 12, 1370 Asker, Norway (1370)
Filed Oct. 22, 1984, Ser. No. 663,691
Claims priority, application Norway, May 8, 1984, 65185
Term of patent 14 years
U.S. Cl. D6—366

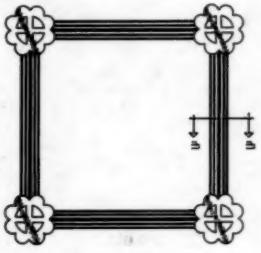
293,050
CHAIR
Gary R. Lemmeyer, East Aurora, and Gordon W. Kamman, Elma, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 17, 1985, Ser. No. 756,022
Term of patent 14 years
U.S. Cl. D6—373



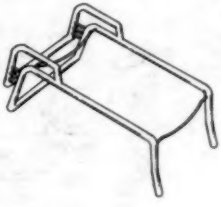
293,051
TABLE
Gary R. Lemmeyer, East Aurora, and Gordon W. Kamman, Elma, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 17, 1985, Ser. No. 756,023
Term of patent 14 years
U.S. Cl. D6—484

293,052
ADJUSTABLE SUPPORT STAND
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed May 13, 1985, Ser. No. 732,915
Term of patent 14 years
U.S. Cl. D6—431

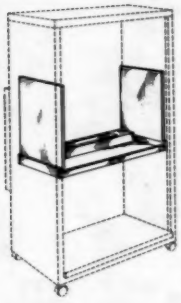
293,053
TABLE GUARD
Willie T. Goolsby, 40 Harwood Dr., Hampton, Va. 23664
Filed Jun. 3, 1985, Ser. No. 740,284
Term of patent 14 years
U.S. Cl. D6—491



293,054
CHAISE LOUNGE FRAME OR SIMILAR ARTICLE
Babette L. Strousse, Manhattan Beach, and Stephen H. Kaminski, Burbank, both of Calif., assignors to Samsonite Corporation, Denver, Colo.
Filed Sep. 11, 1984, Ser. No. 649,789
Term of patent 14 years
U.S. Cl. D6—499



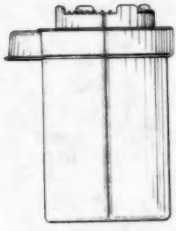
293,055
SHELF FOR COMPUTER KEYBOARD OR THE LIKE
David Wright, Shrewsbury, and Richard M. Latino, Holden, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Feb. 4, 1985, Ser. No. 697,680
Term of patent 14 years
U.S. Cl. D6—510

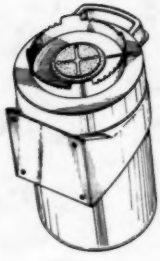


293,056
PAPER TOWEL HOLDER
Dawn M. Likness, MPO. 70L Riverside Dr., and Marvel M. LaRue, MPO. 63L Riverside Dr., both of Washougal, Wash. 98671
Filed Jun. 7, 1985, Ser. No. 742,595
Term of patent 14 years
U.S. Cl. D6—522

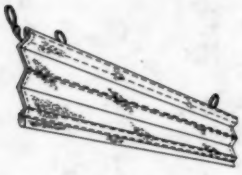
293,057
PAPER TOWEL HOLDER
Dawn M. Likness, MPO. 70L Riverside Dr., and Marvel M. LaRue, MPO. 63L Riverside Dr., both of Washougal, Wash. 98671
Filed Jun. 10, 1985, Ser. No. 743,304
Term of patent 14 years
U.S. Cl. D6—522

293,058
COMBINED DISPENSER FOR SANITARY PAPER AND BRACKET
Jan Iwarsson, Göteborg, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed Apr. 16, 1985, Ser. No. 723,933
Claims priority, application Sweden, Oct. 29, 1984, 84-2892
Term of patent 14 years
U.S. Cl. D6—523

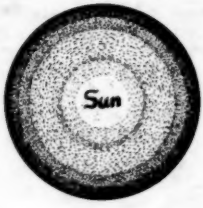




293,059
CURTAIN FOR A WATERCRAFT
Georgia D. Wells, 280 Ocean Ave., Marblehead, Mass. 01945
Filed Feb. 28, 1985, Ser. No. 706,841
Term of patent 14 years
U.S. Cl. D6—575



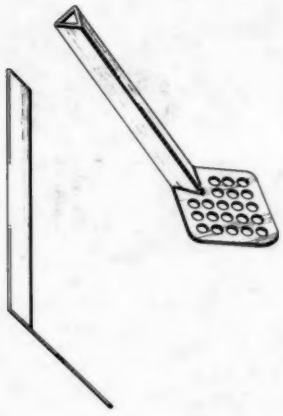
293,060
CIRCULAR TOWEL
Alain D. Boice, 11269 Columbia Pike, Silver Spring, Md. 20901
Filed Mar. 13, 1985, Ser. No. 711,110
Term of patent 14 years
U.S. Cl. D6—608



293,061
BEVERAGE CAN HOLDER
Dale J. Hampton, 695 Belmar Dr., Ogden, Utah 84403
Filed Jan. 10, 1985, Ser. No. 690,309
Term of patent 14 years
U.S. Cl. D7—70

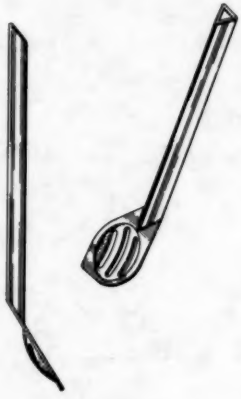
293,062
TOOTHPICK SERVER
Susan H. Levine, Richmond, Calif., assignor to Pottery by Levine, Inc., Richmond, Calif.
Filed May 24, 1985, Ser. No. 737,525
Term of patent 14 years
U.S. Cl. D7—75

293,063
SMALL TURNER
Morgan Ferm, and Karl A. Andersson, both of Malmo, Sweden, assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,135
Claims priority, application Sweden, Oct. 31, 1984, 842908
Term of patent 14 years
U.S. Cl. D7—102

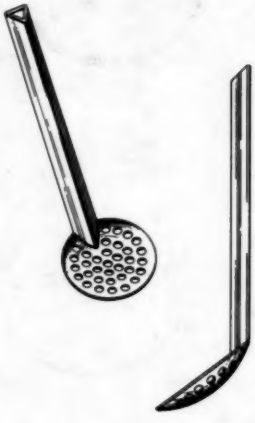


293,064
TURNER
Morgan Ferm, and Karl A. Andersson, both of Malmo, Sweden, assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,136
Claims priority, application Sweden, Oct. 31, 1984, 842906
Term of patent 14 years
U.S. Cl. D7—102

293,065
STIRRING LADLE WITH SLITS
Morgan Ferm, and Karl A. Andersson, both of Malmo, Sweden, assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,134
Claims priority, application Sweden, Oct. 31, 1984, 2909/84
Term of patent 14 years
U.S. Cl. D7—104

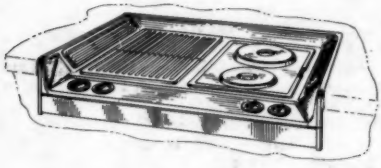


293,066
SKIMMER
Morgan Ferm, and Karl A. Andersson, both of Malmo, Sweden, assignors to Hammarplast AB, Tingsryd, Sweden
Filed Apr. 30, 1985, Ser. No. 729,040
Claims priority, application Sweden, Oct. 31, 1984, 2904/84
Term of patent 14 years
U.S. Cl. D7—104

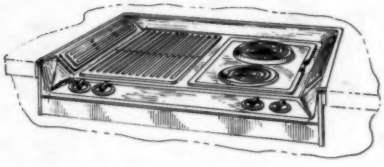


293,067
PORTABLE OUTDOOR COOKER
James C. Stephen, Arlington Heights; Charles W. Lohmeyer, Barrington; Erich J. Schlosser, Lindenhurst, and Donald E. Pestka, Bensenville, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed Jul. 26, 1985, Ser. No. 759,525
Term of patent 14 years
U.S. Cl. D7—334

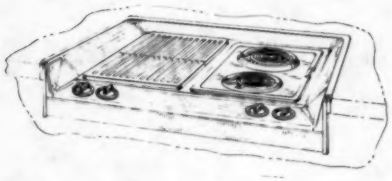
293,068
COUNTERTOP COOKING RANGE
Joseph J. Cerola, Noblesville, Ind., assignor to Roper Corporation, Kankakee, Ill.
Filed Nov. 21, 1984, Ser. No. 674,108
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—346



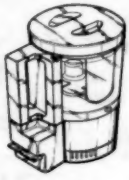
293,069
COUNTERTOP COOKING RANGE
Joseph J. Cerola, Noblesville, Ind., assignor to Roper Corporation, Kankakee, Ill.
Filed Nov. 21, 1984, Ser. No. 674,199
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—346



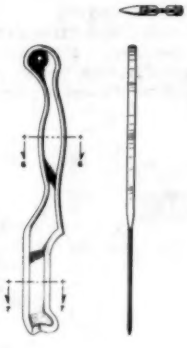
293,070
COUNTERTOP COOKING RANGE
Joseph J. Cerola, Noblesville, Ind., assignor to Roper Corporation, Kankakee, Ill.
Filed Nov. 21, 1984, Ser. No. 674,198
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—346



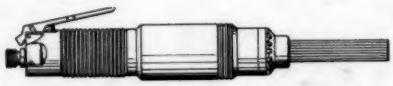
293,071
FOOD PROCESSOR
Young S. Kim, Terrace Sunnyville, Calif., assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 1, 1984, Ser. No. 656,540
Term of patent 14 years
U.S. Cl. D7—384



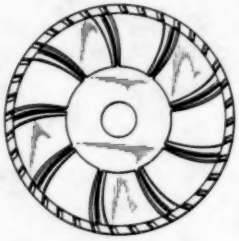
293,072
SPREADER FOR MAYONNAISE OR THE LIKE
Ronald E. Cook, 4311 Erksine Rd., Clarkston, Ga. 30021
Filed Feb. 8, 1985, Ser. No. 699,568
Term of patent 14 years
U.S. Cl. D7—99



293,073
MULTI-NEEDLE TYPE CHISEL
Naoya Kurihara, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Aug. 23, 1983, Ser. No. 525,747
Claims priority, application Japan, Feb. 25, 1983, 58-7609
Term of patent 14 years
U.S. Cl. D8—61

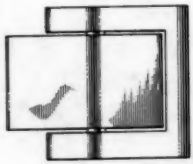


293,074
DIAMOND ABRASIVE SAW BLADE
Jiro Inoue, Sagamihara, Japan, assignor to D.T.R. Co., Ltd., Kanagawa, Japan
Filed Oct. 3, 1984, Ser. No. 657,268
Term of patent 14 years
U.S. Cl. D8—20

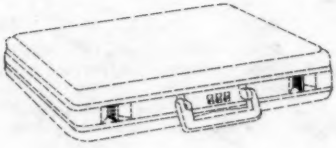


293,075
LOCK ASSEMBLY FOR ZIPPERED LUGGAGE
Urs Gisiger, Gaensbruchlweg 4, 2545 Selzach, Switzerland
Filed Feb. 21, 1985, Ser. No. 703,870
Term of patent 14 years
U.S. Cl. D8—330

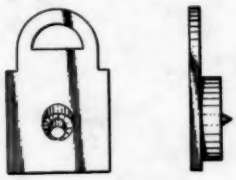
293,076
ASTRAGAL DOOR LATCH
Edward O. Stepanian, Glendale, Calif., assignor to Adams Rite Manufacturing Co., City of Industry, Calif.
Filed Jan. 22, 1985, Ser. No. 693,249
Term of patent 14 years
U.S. Cl. D8—331



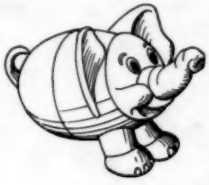
293,077
LOCK LATCH LEVER
John A. Wickman, Swansea, Mass., and M. Edward Lawing, Columbus, Ohio, assignors to American Tourister, Inc., Warren, R.I.
Filed Feb. 26, 1985, Ser. No. 705,594
Term of patent 14 years
U.S. Cl. D8—343



293,078
STRIKE PLATE FOR SURFACE MOUNTED DEAD BOLT LOCK
Anthony R. Lozano, P.O. Box 7107, San Jose, Calif. 95150
Filed Aug. 30, 1985, Ser. No. 771,564
Term of patent 14 years
U.S. Cl. D8—344



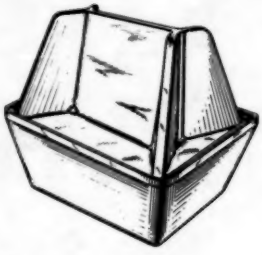
293,079
PACKAGING CONTAINER FOR CANDY OR THE LIKE
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Apr. 8, 1985, Ser. No. 720,948
Claims priority, application Italy, Oct. 15, 1984, 53924/84[U]
Term of patent 14 years
U.S. Cl. D9—318



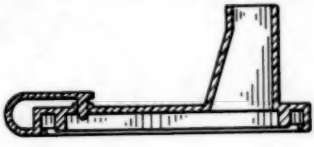
293,080
BOTTLE
John C. Crawford, Lake Mahopac, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jun. 4, 1985, Ser. No. 741,322
Term of patent 14 years
U.S. Cl. D9—376

293,081
BOTTLE
William J. Britt, 7 Newcastle Way, Greenville, S.C. 29615
Filed Aug. 31, 1984, Ser. No. 646,197
Term of patent 14 years
U.S. Cl. D9—376

293,082
CONTAINER FOR FRUIT OR THE LIKE
John J. Butler, 411 Forest Ave., Rye, N.Y. 10580
Filed Apr. 25, 1985, Ser. No. 726,997
Term of patent 14 years
U.S. Cl. D9—424

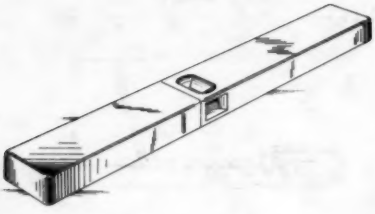


293,083
COMBINED CONTAINER LID AND POUR SPOUT
Daniel O. Gloor, P.O. Box 569, Columbus, Nebr. 68601
Filed Aug. 24, 1984, Ser. No. 644,045
Term of patent 14 years
U.S. Cl. D9—446

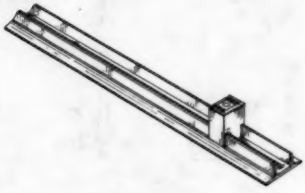


293,084
WATCH CASE
John W. Eddings, Rte. 1, Salem, Ill. 62881
Filed Sep. 26, 1984, Ser. No. 654,851
Term of patent 14 years
U.S. Cl. D10—34

293,085
CASE FOR CLINICAL THERMOMETER
Akira Yokoyama, Iruma, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Apr. 24, 1985, Ser. No. 726,703
Claims priority, application Japan, Dec. 26, 1984, 59-53163
Term of patent 14 years
U.S. Cl. D10—60



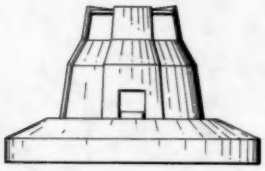
293,086
RULER
Romeo LeMarie, Hong Kong, Hong Kong, assignor to Lambda Integral Design Limited, Kowloon, Hong Kong
Filed May 3, 1985, Ser. No. 730,771
Claims priority, application United Kingdom, Nov. 1, 1984, 1023026
Term of patent 14 years
U.S. Cl. D10—71



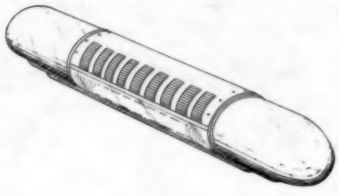
293,087
TANK MIXTURE PROPORTIONING GAUGE
James E. Grinde, 2401-147th La. NE., Anoka, Minn. 55303
Filed Mar. 28, 1985, Ser. No. 717,170
Term of patent 14 years
U.S. Cl. D10—101

293,088
TRANSMITTER
Wilbert C. Brown, Fairfield, Conn., and Roger J. Tosto, Yorktown Heights, N.Y., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Apr. 13, 1984, Ser. No. 599,780
Term of patent 14 years
U.S. Cl. D10—106

293,089
SMOKE DETECTOR HOUSING
David B. Lederer, Rochester, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.
Filed Feb. 1, 1985, Ser. No. 697,159
Term of patent 14 years
U.S. Cl. D10—106



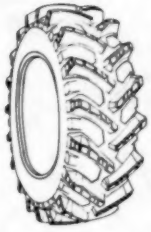
293,090
COMBINED LIGHT AND SPEAKER HOUSING FOR EMERGENCY VEHICLE
Alberto Garnerone, Rosta, Italy, assignor to Sirena S.p.A., Torino, Italy
Filed Mar. 11, 1985, Ser. No. 710,355
Claims priority, application Italy, Sep. 11, 1984, 53806/84[U]
Term of patent 14 years
U.S. Cl. D10—114



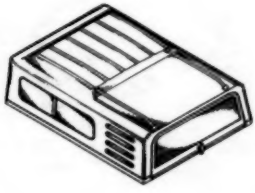
293,091
BURGLAR ALARM ROD
Darrell J. Phillips, 3217 Impala St., Bossier City, La. 71112
Filed May 7, 1985, Ser. No. 731,547
Term of patent 14 years
U.S. Cl. D10—116

293,092
MOTORCYCLE
Kazunori Yamada, Machida; Akihiko Tanaka, Kamakura, and Toshiyuki Sato, Fukuroi, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Apr. 23, 1985, Ser. No. 726,107
Term of patent 14 years
U.S. Cl. D12—110

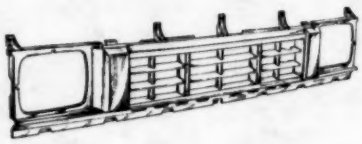
293,093
TIRE
Hideaki Nishio, and Nobuo Shimizu, both of Saitama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jan. 29, 1985, Ser. No. 696,124
Claims priority, application Japan, Jul. 31, 1984, 59-32057
Term of patent 14 years
U.S. Cl. D12—147



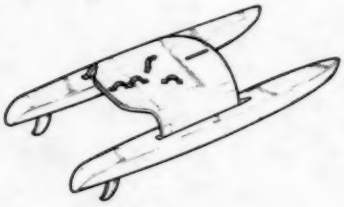
293,094
PICK-UP TRUCK BOX COVER
Martin Brown, Box 63, Drinkwater, Saskatchewan, Canada (S0H 1G0)
Filed Aug. 28, 1985, Ser. No. 770,217
Claims priority, application Canada, Nov. 6, 1984, 06-11-84-2
Term of patent 14 years
U.S. Cl. D12—156



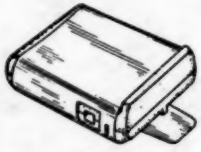
293,095
AUTOMOBILE RADIATOR GRILL
Hirofumi Ienaga, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Oct. 29, 1985, Ser. No. 792,575
Term of patent 14 years
U.S. Cl. D12—163



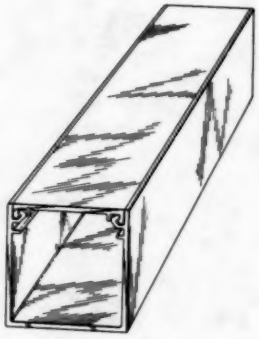
293,096
SAILING VEHICLE
Robert N. Keller, 10388 Enterprise, Davisburg, Mich. 48019
Filed Aug. 22, 1986, Ser. No. 899,322
Term of patent 14 years
U.S. Cl. D12—304



293,097
BATTERY PACK
John H. Alligood, and James M. Spires, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 17, 1985, Ser. No. 745,460
Term of patent 14 years
U.S. Cl. D13—8

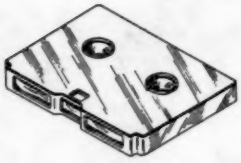


293,098
CONDUIT TRUNKING FOR PROTECTING CABLES
David E. Layton, Rhyl Clwyd, United Kingdom, assignor to EGA Limited, United Kingdom
Filed Jun. 12, 1984, Ser. No. 619,842
Term of patent 14 years
U.S. Cl. D13—13



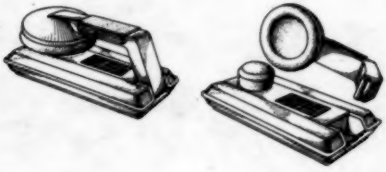
293,099
FACEPLATE FOR ELECTRONIC CIRCUIT BOARD
Michael H. Fitzpatrick, Sunnyvale, Calif., and Michael Brown, Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Feb. 7, 1985, Ser. No. 699,337
Term of patent 14 years
U.S. Cl. D13—13

293,100
CASSETTE
Richard G. Rutkowski, Milford, and John W. Hoover, Huntington, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Dec. 4, 1984, Ser. No. 678,131
Term of patent 14 years
U.S. Cl. D14—11



293,101
COMBINED REPERTORY TELEPHONE DIALER AND ELECTRONIC DESK DIRECTORY
William Sherrill, North Andover; H. Patrick Thornton, Acton, and Brian S. Cole, Arlington, all of Mass., assignors to Automatic Dialer Partners Ltd., Stoneham, Mass.
Filed May 9, 1985, Ser. No. 733,053
Term of patent 14 years
U.S. Cl. D14—52

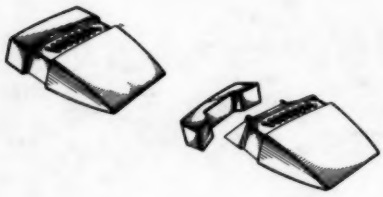
293,102
TELEPHONE SET
Brian P. Bullock, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Mar. 10, 1986, Ser. No. 842,412
Term of patent 14 years
U.S. Cl. D14—53



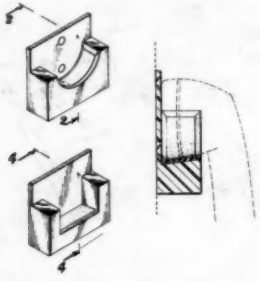
293,103
COMBINATION HANDSET AND STAND TELEPHONE INSTRUMENT
Stig Gauffin, Karlsbergsvagen 33, S-113-34 Stockholm, and Peter Lawton, Mittsparet 1, S-183 47 Taby, both of Sweden
Filed Aug. 22, 1985, Ser. No. 768,425
Claims priority, application Sweden, Feb. 22, 1985, 850444
Term of patent 14 years
U.S. Cl. D14—53

293,104
DESK TELEPHONE SET
John Maliskas, Newtown, Conn., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.
Filed Dec. 23, 1985, Ser. No. 812,031
Term of patent 14 years
U.S. Cl. D14—53

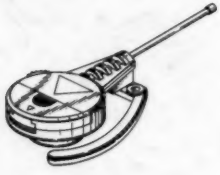
293,105
TELEPHONE SET
Brian P. Bullock, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Mar. 10, 1986, Ser. No. 842,413
Term of patent 14 years
U.S. Cl. D14—53



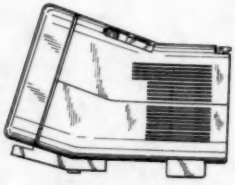
293,106
WALL MOUNT HOLDER FOR TELEPHONE HANDSET
Robert L. Renslow, 7325 Colorado North, Brooklyn Park, Minn. 55443
Filed Dec. 16, 1985, Ser. No. 809,129
Term of patent 14 years
U.S. Cl. D14—65



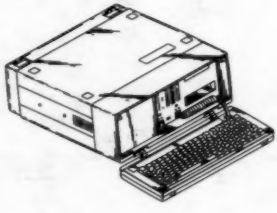
293,107
RADIO
Peter Müller, Baar, Switzerland, assignor to AS Electronics AG, Baar, Switzerland
Filed Oct. 28, 1985, Ser. No. 792,732
Claims priority, application World Int. Prop. O., Apr. 26, 1985, DM/005184
Term of patent 14 years
U.S. Cl. D14—68



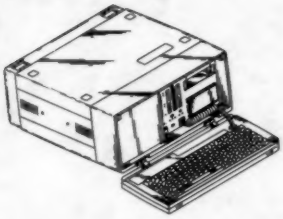
293,108
COLOR TELEVISION SET
Ennio Brion, Milan, Italy, assignor to Brionvega S.p.A., Milan, Italy
Filed Oct. 9, 1984, Ser. No. 659,098
Claims priority, application Italy, Jul. 12, 1984, 22559/84[U]
Term of patent 14 years
U.S. Cl. D14—81



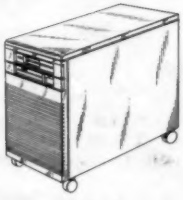
293,109
PROTOCOL ANALYZER
Peter George, Mt. Sinai, and Michael Paloian, Babylon Village, both of N.Y., assignors to Diversified Technology Partners, Ltd.-1982
Filed Mar. 8, 1985, Ser. No. 711,771
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—100



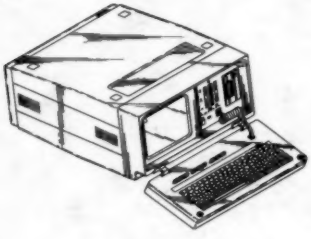
293,110
PROTOCOL/PERFORMANCE ANALYZER
Peter George, Mt. Sinai, and Michael Paloian, Babylon Village, both of N.Y., assignors to Diversified Technology Partners, Ltd.-1982
Filed Mar. 8, 1985, Ser. No. 711,772
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—100



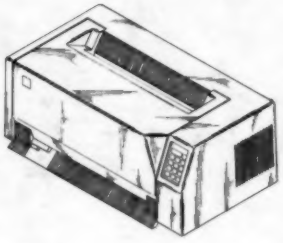
293,111
DATA PROCESSOR
Shigeru Nezu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 20, 1985, Ser. No. 713,840
Claims priority, application Japan, Sep. 21, 1984, 59-39297
Term of patent 14 years
U.S. Cl. D14—102



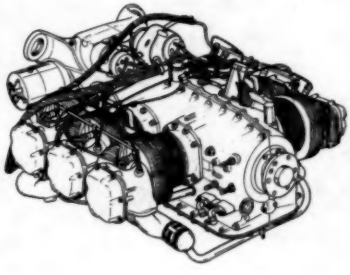
293,112
PROTOCOL ANALYZER
Peter George, Mt. Sinai, and Michael Paloian, Babylon Village, both of N.Y., assignors to Diversified Technology Partners, Ltd-1982
Filed Mar. 8, 1985, Ser. No. 711,773
Term of patent 14 years
U.S. Cl. D14—106



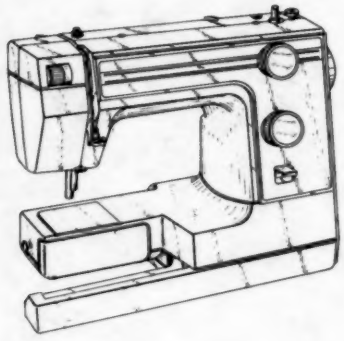
293,113
PRINTER
Hunter T. Foy, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 16, 1985, Ser. No. 766,277
Term of patent 14 years
U.S. Cl. D14—111



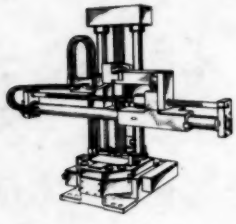
293,114
ENGINE
J. William Brogdon, Daphne, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Continuation of Ser. No. 646,302, Aug. 31, 1984, abandoned.
This application Sep. 11, 1986, Ser. No. 906,649
Term of patent 14 years
U.S. Cl. D15—1



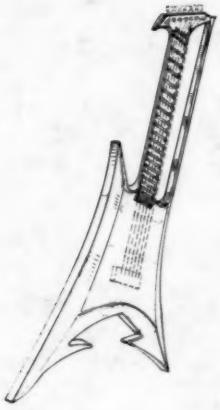
293,115
SEWING MACHINE
Nobufusa Kuroki, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Mar. 20, 1985, Ser. No. 714,109
Claims priority, application Japan, Oct. 18, 1984, 59-42844
Term of patent 14 years
U.S. Cl. D15—69



293,116
INDUSTRIAL ROBOT
Theodore H. Stackhouse; Edward J. Bailey; Roland S. Sedziol, all of Cincinnati; William E. Berry, Deer Park; Kenneth E. Schubeler, West Chester, and Michael D. Braun, Cincinnati, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jun. 5, 1985, Ser. No. 741,411
Term of patent 14 years
U.S. Cl. D15—199

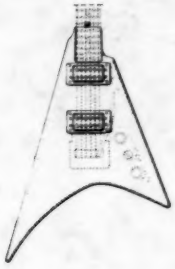


293,117
GUITAR
Floyd D. Rose, 5610 145th Ave., SE., Bellevue, Wash. 98006
Filed Jul. 29, 1985, Ser. No. 760,033
Term of patent 14 years
U.S. Cl. D17—15

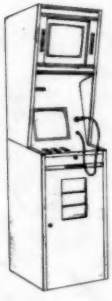


293,118
GUITAR
Floyd D. Rose, 5610 145th Ave. Southeast, Bellevue, Wash. 98006
Filed Jul. 26, 1985, Ser. No. 760,052
Term of patent 14 years
U.S. Cl. D17—19

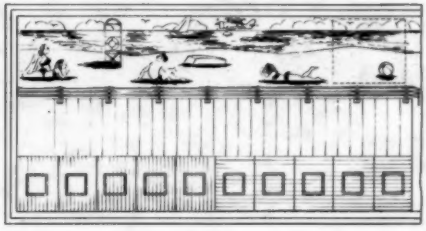
293,119
GUITAR BODY
Michael V. Powers, 1741 52nd St., Meridian, Miss. 39305, assignor to Peavey Electronics Corporation, Meridian, Miss.
Filed Dec. 27, 1985, Ser. No. 814,245
Term of patent 14 years
U.S. Cl. D17—20



293,120
COMPUTER CONSOLE
Maurits L. De Prins, Verhoevenlei 15, Brasschaat 2130, Belgium
Filed Mar. 25, 1986, Ser. No. 845,808
Term of patent 14 years
U.S. Cl. D21—13

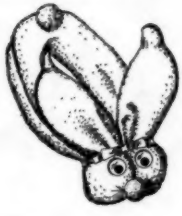


293,121
GAME BOARD
Charles B. Phillips, New York, N.Y., and Edward R. Bick, Marblehead, Mass., assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 13, 1985, Ser. No. 744,448
Term of patent 14 years
U.S. Cl. D21—25

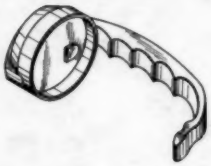


293,122
ROCKING TOY
Charlotte Devaney, 2675 Eaton Street, Vancouver, B.C., V5K 1J9, Canada
Filed Feb. 14, 1984, Ser. No. 579,944
Term of patent 14 years
U.S. Cl. D21—66

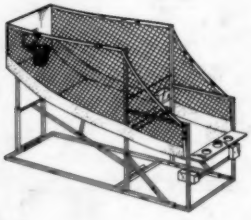
293,123
CLOTH BUNNY
Rhonda K. Zidell, 3903 Beacondale Dr., Austin, Tex. 78759
Filed Jun. 3, 1985, Ser. No. 740,348
Term of patent 14 years
U.S. Cl. D21—187



293,124
HANDLE FOR EXERCISE DEVICE
David D. Sobel, 15415 N. 22nd St., Phoenix, Ariz. 85022
Filed Apr. 19, 1985, Ser. No. 724,968
Term of patent 14 years
U.S. Cl. D21—198



293,125
COMBINED BASKETBALL GAME GOAL AND BALL RETURN
Ken C. Cochran, P.O. Box 1073, Salina, Kans. 67402-1073
Filed Jun. 21, 1985, Ser. No. 747,238
Term of patent 14 years
U.S. Cl. D21—201

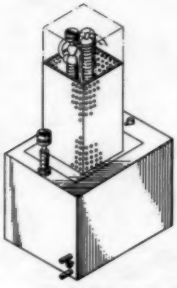


293,126
GOLF PUTTER
Dan D. Bizovi, 8171 New Bradford Dr., Sterling Heights, Mich. 48077
Filed May 20, 1985, Ser. No. 735,699
Term of patent 14 years
U.S. Cl. D21—219

293,127
FLOW CONTROL NOZZLE FOR SPRAYERS
Robert W. Hengesbach, 7886 Mentor Rd., Mentor, Ohio 44060
Continuation-in-part of Ser. No. 461,874, Jan. 28, 1983, Pat. No. Des. 282,392. This application Nov. 23, 1984, Ser. No. 674,272
The portion of the term of this patent subsequent to Jan. 28, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—226

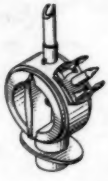
293,130
SUPPORT FLANGE FOR IV DRIP CHAMBER
George Ashie, and Donald L. Millerd, both of San Diego, Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Jul. 18, 1986, Ser. No. 888,042
Term of patent 14 years
U.S. Cl. D24—53

293,128
MICROWAVE DISTILLATION APPARATUS
Narbik A. Karamian, Bethesda, Md., assignor to Raf-Tan Inc., Bethesda, Md.
Filed Oct. 15, 1985, Ser. No. 787,724
Term of patent 14 years
U.S. Cl. D23—207



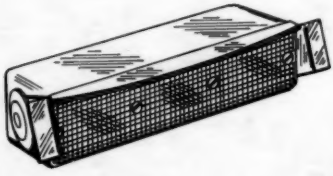
293,131
BALUSTER
John B. Noyce, Roswell, Ga., assignor to Manufacturers Merchandising Corp., Roswell, Ga.
Filed Nov. 16, 1984, Ser. No. 672,072
Term of patent 14 years
U.S. Cl. D25—129

293,129
DRUG DELIVERY VALVE FOR IV FLUID INFUSION SYSTEM
Donald L. Millerd; Robert S. Alpert, and John E. Kling, all of San Diego, Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed Jun. 10, 1985, Ser. No. 742,776
Term of patent 14 years
U.S. Cl. D24—53



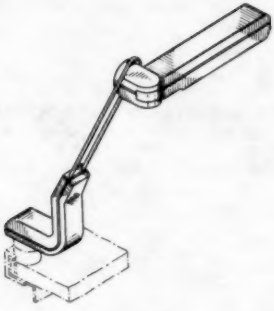
293,132
BALUSTER
John B. Noyce, Roswell, Ga., assignor to Manufacturers Merchandising Corp., Roswell, Ga.
Filed Nov. 16, 1984, Ser. No. 672,073
Term of patent 14 years
U.S. Cl. D25—128

293,133
LIGHT ASSEMBLY FOR MOTOR VEHICLE
P. John Wood, Solana Beach, Calif., assignor to BAC-OFF Corporation, San Diego, Calif.
Filed May 24, 1985, Ser. No. 737,522
Term of patent 14 years
U.S. Cl. D26—28

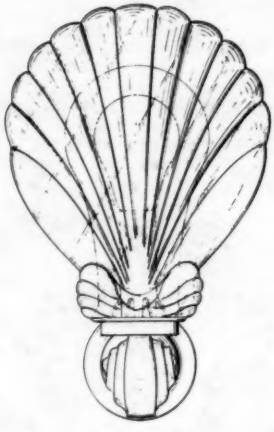


293,134
AUTOMOBILE TAILLIGHT
Shinya Mori, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Oct. 16, 1984, Ser. No. 661,530
Claims priority, application Japan, Sep. 19, 1984, 59-38891
Term of patent 14 years
U.S. Cl. D26—35

293,135
DESK LAMP
Douglas J. Medema, Pompano, Fla.; Donald J. Staufenberg, Hudsonville, and James O. Kelley, Spring Lake, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Apr. 25, 1985, Ser. No. 727,279
Term of patent 14 years
U.S. Cl. D26—61



293,136
LIGHTING FIXTURE
Gerhard E. Joerger, Hans-Thoma-Strasse 89-99, 6800 Mannheim 25, Fed. Rep. of Germany
Filed Aug. 12, 1985, Ser. No. 764,898
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, MR V/1291
Term of patent 14 years
U.S. Cl. D26—87

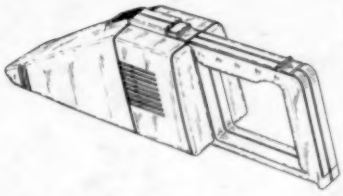


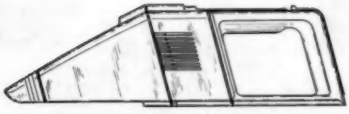
293,137
FINGER REST
Frederick J. Loerop, 1341 SE. 6th Ave., Deerfield Beach, Fla. 33441
Filed Dec. 16, 1985, Ser. No. 809,027
Term of patent 14 years
U.S. Cl. D28—61

293,138
DRY SHAVER
Klaas T. Oord, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 20, 1985, Ser. No. 703,247
Claims priority, application Benelux, Aug. 23, 1984, 59281-03
Term of patent 14 years
U.S. Cl. D28—50

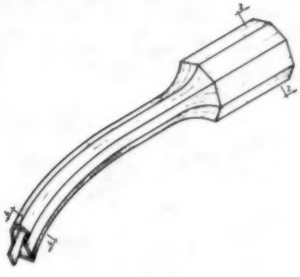
293,139
ADJUSTABLE DOG HARNESS
Milton J. Roa, 454 Redwing Rd., Chula Vista, Calif. 92011
Filed Mar. 29, 1985, Ser. No. 718,025
Term of patent 14 years
U.S. Cl. D30—152

293,140
VACUUM CLEANER
Aloysius J. M. Beeren, Haren, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 9, 1985, Ser. No. 753,204
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, MR16002
Term of patent 14 years
U.S. Cl. D32—18





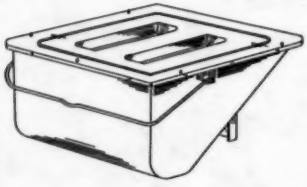
293,141
VACUUM CLEANER ATTACHMENT FOR CLEANING REFRIGERATOR COILS
Rick G. Blocker, 7801 Canisius, Hazelwood, Mo. 63042
Filed Jul. 13, 1984, Ser. No. 630,739
Term of patent 14 years
U.S. Cl. D32—25



293,142
CARPET SWEEPER
Akira Kubota, Ryugasaki, Japan, assignor to Hukuba Kogyo Kabushiki Kaisha, Japan
Filed Jan. 8, 1985, Ser. No. 689,669
Claims priority application Japan, 59-33321
Term of patent 14 years
U.S. Cl. D32—38

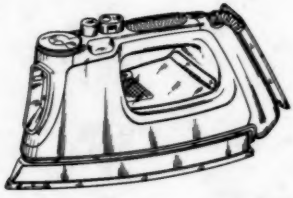
293,143
SCRAPER
Clifford B. Cornell, 7700 E. 112th Ter., Kansas City, Mo. 64134
Filed May 12, 1986, Ser. No. 862,521
Term of patent 14 years
U.S. Cl. D32—46

293,144
PAINT CONTAINER AND COVER THEREFOR
Helmut H. Papke, 125 Lincoln Road, Waterloo, Ontario, Canada N2J 2N9; Siegfried E. Arndt, R.R. #1, Moorefield, Ontario, Canada N0G 2K0; Dieter W. Arndt, 40 Manley Street, Ayr, Ontario, Canada N0B 1E0, and Claus D. Krueger, 199 King Street, St. Jacobs, Ontario, Canada N0B 2N0
Filed Dec. 21, 1984, Ser. No. 685,044
Claims priority, application Canada, Jun. 27, 1984, 27-06-84-11
Term of patent 14 years
U.S. Cl. D32—53.1

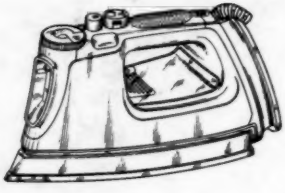


293,145
KNOCKDOWN DRYING RACK FOR SHOES AND GLOVES
Leland G. Hughes, and Jacqueline S. Hughes, both of 31929 Owl Rd., Eugene, Oreg. 97405
Filed Jul. 8, 1985, Ser. No. 752,961
Term of patent 14 years
U.S. Cl. D32—58

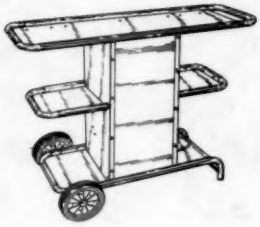
293,146
ELECTRIC IRON
Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France
Filed Jun. 11, 1985, Ser. No. 743,655
Claims priority, application France, Dec. 19, 1984, 845.720
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—70



293,147
ELECTRIC IRON
Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France
Filed Jun. 11, 1985, Ser. No. 743,654
Claims priority, application France, Dec. 19, 1984, 845 720
The portion of the term of this patent subsequent to Dec. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—70

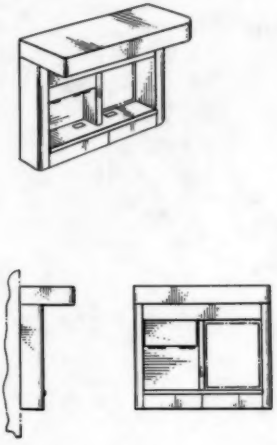


293,148
CART
Hans Wedel, Menden, Fed. Rep. of Germany, assignor to Cramer GmbH & Co KG, Menden, Fed. Rep. of Germany
Filed Feb. 15, 1985, Ser. No. 702,372
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, MR1023
Term of patent 14 years
U.S. Cl. D34—21

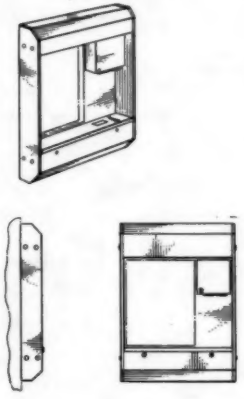


293,149
MODULAR TISSUE DISPENSING CART
Henri Minost, Neuilly s/Seine, France, assignor to Beghin-Say, S.A., Thumeries, France
Filed Mar. 18, 1985, Ser. No. 712,516
Claims priority, application France, Sep. 17, 1984, 84.4046
Term of patent 14 years
U.S. Cl. D34—26

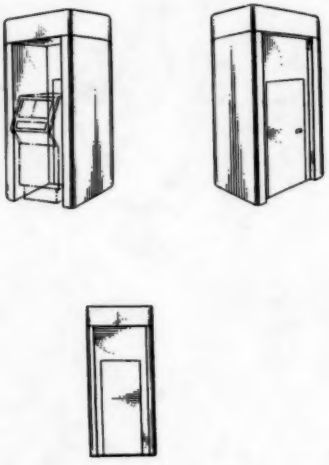
293,150
AUTOMATED TELLER SERVICE CENTER ENCLOSURE
Ernest F. J. Prinzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.
Filed May 13, 1985, Ser. No. 709,213
Term of patent 14 years
U.S. Cl. D99—28



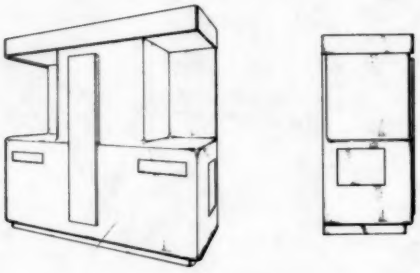
293,151
AUTOMATED TELLER SERVICE CENTER ENCLOSURE
Ernest F. J. Prinzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.
Filed May 13, 1985, Ser. No. 709,217
Term of patent 14 years
U.S. Cl. D99—28



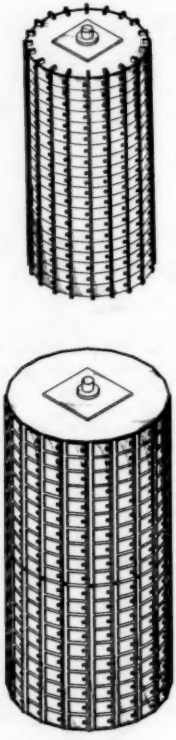
293,152
AUTOMATED TELLER ENCLOSURE
Ernest F. J. Prinzhorn, Los Angeles, Calif., assignor to QRS Corporation, Los Angeles, Calif.
Filed May 13, 1985, Ser. No. 709,218
Term of patent 14 years
U.S. Cl. D99—28



293,153
SELF-SERVICE POSTAL FACILITY OR SIMILAR ARTICLE
Mark B. McKellar, 3130 Walnut Bend, #404, Houston, Tex. 77042
Filed Apr. 23, 1985, Ser. No. 726,043
Term of patent 14 years
U.S. Cl. D99—29



293,154
POSTAL BOX UNIT OR SIMILAR ARTICLE
Mark B. McKellar, 3130 Walnut Bend, #404, Houston, Tex. 77042
Filed Apr. 23, 1985, Ser. No. 726,026
Term of patent 14 years
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF DECEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.K.G.S.: *See*—
Andres, Kenneth E.; Weingardt, Gary; and Durbin, James L., 4,711,390, Cl. 229-41.00R.

A-Lok Products, Inc.: *See*—
Ditcher, Jack; and Westhoff, James A., 4,711,455, Cl. 277-9.500.

A. Nattermann & Cie GmbH: *See*—
Welter, Andre ; Leyck, Sigurd; and Etschenberg, Eugen, 4,711,961, Cl. 548-121.000.

A/S Atlas: *See*—
Ullum, Henrik, 4,711,041, Cl. 34-179.000.

Aarts, Herman J. C. M.: *See*—
Van Hoof, Isidoor K.; and Aarts, Herman J. C. M., 4,711,824, Cl. 428-607.000.

Abbott Laboratories: *See*—
Ritter, G. Thomas; and Budniak, Mitchell, 4,711,987, Cl. 219-358.000.

Abdollahian, Mehdy: *See*—
Butler, Scott J.; Smith, Robert K.; and Abdollahian, Mehdy, 4,712,046, Cl. 315-248.000.

Abe, Noriyuki: *See*—
Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, 4,712,211, Cl. 370-100.000.

Abe, Taizou: *See*—
Tsukahara, Kenji; and Abe, Taizou, 4,711,616, Cl. 417-216.000.

Abinett, Raymond E., to Lucas Industries Public Limited Company. Fuel injection pumps. 4,711,618, Cl. 417-462.000.

Abraham, Edward D., to Abraham, Lucille S. Conveyor transfer apparatus for foundry use and method of conveyor transfer. 4,711,342, Cl. 198-463.300.

Abraham, Lucille S.: *See*—
Abraham, Edward D., 4,711,342, Cl. 198-463.300.

Abuyama, Yasuo, to Kabushiki Kaisha Toshiba. Copying machine with an interrupt function. 4,711,556, Cl. 355-14.00R.

AccSys Technology, Inc.: *See*—
Hamm, Robert W., 4,712,042, Cl. 315-5.410.

Acharya, Arun; and Bevier, William E., to Union Carbide Corporation. Single component adsorption process. 4,711,646, Cl. 55-33.000.

Adachi, Masahiro: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.

Adachi, Mitsunori: *See*—
Tomita, Satoru; and Adachi, Mitsunori, 4,712,142, Cl. 358-285.000.

Adaptable Tool Company, The: *See*—
Caldwell, Donald B.; and Spring, Robert J., 4,711,299, Cl. 166-105.100.

Adinolfi, Philip J.: *See*—
Zucker, Richard S.; and Adinolfi, Philip J., 4,711,351, Cl. 206-331.000.

Adir et Compagnie: *See*—
Wierzbicki, Michel; Hugon, Pierre; and Poignant, Jean-Claude, 4,711,885, Cl. 514-253.000.

Adolf Hottinger Giesserei und Maschinenbau GmbH: *See*—
Rommel, Reiner; and Landaua, Werner, 4,711,292, Cl. 164-200.000.

Adomeit, Heinz-Dieter. Height adjusting arrangement for a guide fitment of a safety belt. 4,711,498, Cl. 297-468.000.

Advanced Micro Devices, Inc.: *See*—
Joshi, Sunil P.; and Iyer, Venkatraman, 4,712,215, Cl. 371-37.000.

Advanced Thermal Systems, Inc.: *See*—
Hannah, Daniel E.; Miliczky, Eugene W.; Bea, Clifford F.; and Hannah, Martin J., 4,711,013, Cl. 29-402.020.

Aerojet-General Corporation: *See*—
Fortunko, Chris M., 4,711,152, Cl. 89-6.500.

Affarsverket FFV: *See*—
Sundberg, Sten; Risberg, Stig; and Eriksson, Ulf, 4,711,179, Cl. 102-426.000.

Agee, Jerry W. Tool handle and head assembly. 4,711,594, Cl. 403-263.000.

Agency of Industrial Science & Technology: *See*—
Kikuchi, Kaoru; and Shikata, Nobuo, 4,711,707, Cl. 204-145.00R.

Agfa Gevaert Aktiengesellschaft: *See*—
Pertzach, Albert; Zeroni, Ludwig; and Brunner, Hubert, 4,712,150, Cl. 360-132.000.

AGFA-Gevaert N.V.: *See*—
Nelen, Petrus R., 4,711,570, Cl. 355-91.000.

Ahamco Investments, Inc.: *See*—
Patton, Edward J., 4,711,058, Cl. 52-101.000.

Aichi Steel Works, Ltd.: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,711,675, Cl. 148-144.000.

Aida Engineering Co., Ltd.: *See*—
Imanishi, Shozo; and Sato, Mitsuo, 4,711,169, Cl. 100-257.000.

Air Products and Chemicals, Inc.: *See*—
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,711,737, Cl. 252-77.000.
Kumar, Ravi, 4,711,645, Cl. 55-26.000.

Aisin Seiki Kabushika Kaisha: *See*—
Kazaoka, Kenichi; Wakamatsu, Fumio; and Shinkai, Yasuo, 4,711,497, Cl. 297-458.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Iwasaki, Shinichiro, 4,712,034, Cl. 310-217.000.

Aisin-Warner Kabushiki Kaisha: *See*—
Miura, Masakatsu; and Aoki, Hideyuki, 4,711,138, Cl. 74-761.000.

Ajinomoto Co., Inc.: *See*—
Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.
Yokozeki, Kenzo; and Kubota, Koji, 4,711,846, Cl. 435-70.000.

Akahane, Kenji: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.

Akita, Shinji: *See*—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.

Aktiebolaget Bofors: *See*—
Dahlberg, Kurt, 4,712,181, Cl. 364-423.000.

Akzo N.V.: *See*—
Jacobson, Walter; Riggio, Stephen C.; and Turner, James E., 4,711,852, Cl. 436-15.000.

Alba, Andrew J.; Griesemer, James A.; and Gordon, Robert L., to International Paper Company. Self-supporting and spill resistant food carton. 4,711,389, Cl. 229-1.50B.

Albach, Manfred, to U.S. Philips Corporation. Circuit arrangement for forming a direct voltage from a sinusoidal input voltage. 4,712,169, Cl. 363-89.000.

Albeck, Bernhard; and Goedicke, Siegfried, to Schwabe GmbH. Method of making core laminations, and punch die for carrying out the method. 4,711,019, Cl. 29-609.000.

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Heck, Wolfgang; Kersten, Peter; and Volz, Hans, 4,712,083, Cl. 338-32.00R.

Alcazar, David G.: *See*—
Kwun, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.

Alderson, Richard, to Fiberoptic Sensor Technologies, Inc. Fiber optic coupled pressure transducer using single fiber and method of fabrication. 4,711,246, Cl. 128-667.000.

Aldred, Edward J., to Ransomes Sims & Jefferies PLC. Grass cutting attachment for tractor. 4,711,072, Cl. 56-6.000.

Alexander, Randall W.: *See*—
Troupes, Demetrios; and Alexander, Randall W., 4,712,102, Cl. 340-790.000.

Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I. Magnetic suspension for a vehicle. 4,711,182, Cl. 104-283.000.

Alfa Romeo Auto S.p.A.: *See*—
Radaelli, Dario; and Giraudi, Walter, 4,711,400, Cl. 239-585.000.

Alferness, Rodney C., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Electrooptic polarization multiplexer/demultiplexer. 4,711,515, Cl. 350-96.140.

Allegheny Ludlum Corporation: *See*—
Benford, James G., 4,711,113, Cl. 72-197.000.

Allied Corporation: *See*—
Jen, Kwan-Yue A.; and Elsenbaumer, Ronald L., 4,711,742, Cl. 252-500.000.
Vora, Kishore N.; Carrico, John P., Sr.; Spangler, Glenn E.; Campbell, Donald N.; and Martin, Charles E., 4,712,008, Cl. 250-287.000.

Alm, Ake W., to Hughes Aircraft Company. Radiator scanning with image enhancement and noise reduction. 4,712,010, Cl. 250-334.000.

Alps Electric Co., Ltd.: *See*—
Nakanowatari, Jun; and Kano, Mitsuru, 4,711,530, Cl. 350-339.00R.
Numata, Hidetaka, 4,712,053, Cl. 318-663.000.

Altenpohl, Paul J. Accurate weight sorting arrangement for poultry conveyor system. 4,711,344, Cl. 198-504.000.

Althouse, Victor E., to Vichem Corporation. Method for handling semiconductor die and the like. 4,711,014, Cl. 29-412.000.

Aluminum Company of America: *See*—
Musselman, Lawrence L.; and Levendusky, Thomas L., 4,711,673, Cl. 106-287.170.

Sukonnik, Israil M.; Judge, John S.; and Kilgore, Colin H., 4,711,115, Cl. 72-329.000.
Vernam, William D.; and Lifka, Bernard W., 4,711,762, Cl. 420-532.000.

Amano, Haruo, to NEC Corporation. Process of fabricating semiconductor device. 4,711,699, Cl. 437-52.000.

Amano, Keijirou: *See*—
Takahashi, Yukio; Hayase, Isao; Amano, Keijirou; Mizukami, Masao; and Ishiguri, Masaaki, 4,711,620, Cl. 418-96.000.

Ambach, Eberhard: *See*—
Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, 4,711,930, Cl. 502-209.000.

American Cyanamid Company: *See*—
Kuzara, David J., 4,711,244, Cl. 128-632.000.
Lehmann, Leonard T., 4,711,241, Cl. 128-335.500.
Paul, Albert P.; Szarz, Richard A.; and Card, Roger J., 4,711,669, Cl. 106-38.510.

American Hospital Supply Corporation: *See*—
McCartney, Ronald L., 4,711,522, Cl. 350-96.210.

American Optical Corporation: *See*—
Krusas, James J.; and Pienta, Joseph J., 4,711,539, Cl. 351-63.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Alferness, Rodney C., 4,711,515, Cl. 350-96.140.
Bossard, Peter R.; and Mucha, John A., 4,711,118, Cl. 73-73.000.
Miller, David A. B., 4,711,997, Cl. 250-216.000.
Snyder, Donald Q., 4,711,053, Cl. 51-3.000.

American Telephone and Telegraph Company, AT&T Bell Labs: *See*—
Ansell, Henry G.; and Saunders, Jeffrey H., 4,712,077, Cl. 331-25.000.

American Telephone & Telegraph Company, AT&T Information Systems Inc.: *See*—
Brown, Reed S.; Consoli, John J.; and Klier, Richard G., 4,712,236, Cl. 379-433.000.

Amick, David R.; Hann, William M.; and Natoli, John, to Rohm and Haas Co. Method of stabilizing aqueous systems. 4,711,725, Cl. 210-701.000.

Ammco Tools, Inc.: *See*—
Mountz, Craig E., 4,711,325, Cl. 188-32.000.

Amoco Corporation: *See*—
Young, Grant A., 4,711,720, Cl. 210-512.200.

Analytichem International, Inc.: *See*—
Good, Thomas J., 4,711,764, Cl. 422-65.000.

Ancor Industries, Inc.: *See*—
Anderson, Linda K., 4,712,031, Cl. 310-90.000.

Anderson, John J., to S. C. Johnson & Son, Inc. Spray cap assembly comprising a base unit and push/pull closure means. 4,711,378, Cl. 222-499.000.

Anderson, Joseph A., to Haybuster Manufacturing, Inc. Chaff blower for combines. 4,711,253, Cl. 130-27.00R.

Anderson, Karen L.: *See*—
Mintzer, Frederick C.; and Anderson, Karen L., 4,712,140, Cl. 358-260.000.

Anderson, Linda K., to Ancor Industries, Inc. Unit bearing motor with hydrodynamic lubricating system. 4,712,031, Cl. 310-90.000.

Ando, Hirohito; Takada, Zenji; and Shigeta, Yuko, to Dainippon Ink and Chemicals, Inc. Non-bronzing reddish lake pigment. 4,711,674, Cl. 106-289.000.

Ando, Makoto; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Drive coupling device for optical instruments. 4,711,528, Cl. 350-257.000.

Ando, Toshio; Nishihara, Toshikazu; and Kimura, Akihiro, to Victor Company of Japan, Ltd. Magnetic medium for horizontal magnetization recording and method for making same. 4,711,810, Cl. 428-336.000.

Andraa , Rainer; and Hofmann, Manfred, to Metzeler Kautschuk GmbH. Two-chamber engine mount with hydraulic damping. 4,711,206, Cl. 123-192.00R.

Andreas Stihl: *See*—
Holderle, Hans; Wolf, Jurgen; Eckhart, Horst; and Vonderau, Werner, 4,711,225, Cl. 123-590.000.

Andres, Kenneth E.; Weingardt, Gary; and Durbin, James L., to A.K.G.S. Collapsible box for trash compacting system. 4,711,390, Cl. 229-41.00R.

Andrews, Ronnie H.: *See*—
Machado, Octavio J.; Daugherty, David A.; Andrews, Ronnie H.; and Efferding, Larry E., 4,711,758, Cl. 376-272.000.

Anello, Paul Joseph: *See*—
Annello, Joan, 4,711,031, Cl. 30-294.000.

Angehrn, Jorg A.; and Fischer, Dennis J., to Chevron Research Co. Flexible mud excluder for borehole televiewer. 4,711,122, Cl. 73-151.000.

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Anno, Hiroshi: *See*—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.

Ansell, Henry G.; and Saunders, Jeffrey H., to American Telephone and Telegraph Company, AT&T Bell Labs. Tristate phase-lock loop prevents false lock. 4,712,077, Cl. 331-25.000.

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Antone, Wayne L., II; and Finnell, Dennis C. Wall outlet cover plate assembly. 4,711,634, Cl. 439-136.000.

Anttonen, Kauko K.: *See*—
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,712,086, Cl. 338-315.000.

Aoki, Chihiro: *See*—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.

Aoki, Hideyuki: *See*—
Miura, Masakatsu; and Aoki, Hideyuki, 4,711,138, Cl. 74-761.000.

Aoki, Hiromitsu: *See*—
Otsuki, Tatsuo; Shimano, Akio; Aoki, Hiromitsu; and Aoki, Ikuko, 4,712,023, Cl. 307-450.000.

Aoki, Hiroyuki, to Kabushiki Kaisha Toshiba. Dot interpolation control system. 4,712,185, Cl. 364-518.000.

Aoki, Ikuko: *See*—
Otsuki, Tatsuo; Shimano, Akio; Aoki, Hiromitsu; and Aoki, Ikuko, 4,712,023, Cl. 307-450.000.

Aoki, Ken-ichi: *See*—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.

Aoyagi, Yoshiaki: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.

Apolinar, Ermelinda A.: *See*—
Herrington, Richard A.; Kleman, Thomas G.; and Apolinar, Ermelinda A., 4,711,056, Cl. 51-410.000.

APTI, Inc.: *See*—
Eastlund, Bernard J.; and Ramo, Simon, 4,712,155, Cl. 361-231.000.

Arakawa, Kazuhiko; Terashima, Jun; and Tokura, Go, to Canon Kabushiki Kaisha. Assembly structure of printed circuit boards for camera. 4,711,548, Cl. 354-485.000.

Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, to Japan Atomic Energy Research Institute; and Matsumura Oil Research Corporation. Radiation-resistant grease. 4,711,732, Cl. 252-28.000.

Aramaki, Minoru; and Sakaguchi, Hiroaki, to Central Glass Company Limited. Method of converting fluorine-containing high polymer into lower molecular weight polymer. 4,711,949, Cl. 525-356.000.

Archung, Ralph, to Boeing Company, The. Hydraulic system for aircraft. 4,711,089, Cl. 60-405.000.

Ares, Roland A.; Jones, Robert A.; and Street, Norman E., to Hussmann Corporation. Reverse cycle heat reclaim coil and subcooling method. 4,711,094, Cl. 62-90.000.

Argentini, Dino E., to Raytheon Company. Method for forming an insulator having a conductive surface. 4,711,859, Cl. 437-209.000.

Argyrakis, Nikolaus, to Diehl GmbH & Co. Ammunition incorporating searching fuse with trajectory correctable during its final flight phase and method for combating armored target objects. 4,711,178, Cl. 102-384.000.

Arikawa, Yoshijiro: *See*—
Ishida, Tetsuyoshi; Okiura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, 4,711,828, Cl. 429-12.000.

Arimoto, Akira: *See*—
Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, 4,712,218, Cl. 372-38.000.

Aristech Chemical Corporation: *See*—
Cullo, Leonard A.; and Shiring, Francis J., III, 4,711,869, Cl. 502-239.000.

Arkles, Barry C.; and Brinigar, William S., to Petrarch Systems Inc. Method of siliconization of surfaces with lower alkyl silanes. 4,711,820, Cl. 428-429.000.

Armbruster, Joseph M. Built-in vehicle air filtration system. 4,711,159, Cl. 98-2.110.

Armor Metals, Inc.: *See*—
Rodgers, E. Walter, 4,712,232, Cl. 379-329.000.

Arnce, John W., to Plush, Richard Lee, Jr. Quick change self-oiling sprocket hub. 4,711,635, Cl. 474-152.000.

Arnold, Fred E.: *See*—
Tan, Loon-Seng; and Arnold, Fred E., 4,711,964, Cl. 548-461.000.

Arthur G. Russell Company, Inc., The: *See*—
Bartlett, Maynard L., 4,711,337, Cl. 198-391.000.

Aruga, Tamotsu: *See*—
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.

Asahi Glass Company Ltd.: *See*—
Kojima, Masaki; and Munekata, Seiji, 4,711,926, Cl. 524-512.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Taniyama, Tadayoshi; and Yoshida, Koichi, 4,711,842, Cl. 435-68.000.

Asakura, Osamu: *See*—
Nozaki, Mineo; and Asakura, Osamu, 4,711,591, Cl. 400-225.000.

Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, to Mitsubishi Denki Kabushiki Kaisha. Rotary compressor. 4,711,617, Cl. 417-295.000.

Asao, Haruhiko: *See*—
Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, 4,711,433, Cl. 266-222.000.

Asbjornsen, Svein; and Lade, Jan. Chair back arrangement. 4,711,492, Cl. 297-284.000.

Asea AB: *See*—
Hellgren, Keijo, 4,711,111, Cl. 72-63.000.

Ashbrook, Clifford L. Antipersonnel shotgun choke. 4,711,048, Cl. 42-79.000.

Ashe, Bonnie M.: *See—*
Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., 4,711,886, Cl. 514-195.000.

Ashfield, Jacqueline M.: *See—*
Wilkinson, John; and Holbrook, Nicholas, 4,711,061, Cl. 52-410.000.

Ashfield, Michele: *See—*
Wilkinson, John; and Holbrook, Nicholas, 4,711,061, Cl. 52-410.000.

Ashland Oil, Inc.: *See—*
Kemp, Paul C.; and Lyons, Walter, 4,711,643, Cl. 44-51.000.

Asmussen, Bodo: *See—*
Nick, Erich; Guse, Gunter; and Asmussen, Bodo, 4,711,781, Cl. 424-446.000.

Aso, Toshiyuki; and Ishibashi, Tamotu, to Fanuc Ltd. Combined wire electrode electrical discharge machine and initial hole forming device. 4,711,981, Cl. 219-69.00W.

Aspden, Garth J., to National Nuclear Corporation Limited. Shields for nuclear reactors. 4,712,015, Cl. 250-517.100.

Asper, Jean-Jacques; and Cottenceau, Remi, to Motul S.A. Helmet for protection against impacts and a method of manufacturing the said helmet. 4,710,984, Cl. 2-412.000.

Association of American Railroads: *See—*
Kwun, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.

Astafiev, Nikolai A.: *See—*
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.

Atalla, Anwar A.: *See—*
Swin, Richard E., Sr.; and Atalla, Anwar A., 4,711,161, Cl. 98-31.500.

Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Vesselina B; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., to TPO "Pharmachim". Penicillin derivatives. 4,711,956, Cl. 540-327.000.

Atkinson, Jeffrey: *See—*
Mazzarella, Emil D.; Maliczyszyn, Walter; and Atkinson, Jeffrey, 4,711,671, Cl. 106-243.000.

Atlantic Richfield Company: *See—*
Patrick, David H., 4,711,474, Cl. 285-332.300.
Statton, Gary L.; and Gaul, James M., 4,711,910, Cl. 521-107.000.
Younes, Usama E., 4,711,941, Cl. 526-272.000.

Atlas Copco Aktiebolag: *See—*
Wasel, Horst P.; and Grollius, Horst W., 4,711,706, Cl. 204-129.650.

Atochem: *See—*
Massa, Andre; and Dupasquier, Guy, 4,711,070, Cl. 53-573.000.

Atwood, Charles W.: *See—*
Williams, Rodger W.; and Atwood, Charles W., 4,711,352, Cl. 206-365.000.

Audio Technica U.S., Inc.: *See—*
Reichel, Kenneth R.; and Hebrock, Steve, 4,712,093, Cl. 340-540.000.

Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, to Schering Aktiengesellschaft. Use of terguride as a geriatric agent. 4,711,891, Cl. 514-313.000.

Austin-Berryhill Fabrication, Inc.: *See—*
Berryhill, Robert A., 4,711,649, Cl. 55-97.000.

Autotrol Corporation: *See—*
Goudy, Paul R., Jr.; and Weekley, William G., 4,711,370, Cl. 221-265.000.

Avco Corporation: *See—*
Brockett, Walter D., 4,711,084, Cl. 60-39.070.

Aver, John H., Jr.; and Petit, William A., to General Signal Corporation. Radio based railway signaling and traffic control system. 4,711,418, Cl. 246-5.000.

AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List: *See—*
Stubenberg, Johann; Denk, Heimo; and Zeiringer, Rudolf, 4,711,129, Cl. 73-708.000.

Avramova, Ruska S.: *See—*
Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Vesselina B; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.

Avsharov, Eduard R.: *See—*
Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.

Awano, Toshimi: *See—*
Hayashi, Keijiro; and Awano, Toshimi, 4,711,462, Cl. 280-610.000.

Axen, Rolf E. A. V.; and Carlsson, Jan P. E., to Pharmacia Aktiebolag. Therapeutically active compound and pharmaceutical composition containing the same. 4,711,951, Cl. 530-323.000.

B. F. Goodrich Company, The: *See—*
Hawrylko, Roman B., 4,711,908, Cl. 521-56.000.
Lai, John T., 4,711,957, Cl. 544-231.000.
Lehr, Marvin H., 4,711,921, Cl. 524-180.000.

B. Hagemann & Co.: *See—*
Silbernagel, Peter, 4,711,069, Cl. 53-556.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Ishida, Tetsuyoshi; Okiura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, 4,711,828, Cl. 429-12.000.
Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, 4,711,872, Cl. 502-328.000.

Babuin, Piero: *See—*
Mori, Maurizio; Babuin, Piero; and Cargnel, Giuseppe, 4,711,103, Cl. 68-12.00R.

Bach, Hanswilhelm: *See—*
Konkol, Werner; Bahrmann, Helmut; Dambkes, Georg; Gick, Wilhelm; Wiebus, Ernst; and Bach, Hanswilhelm, 4,711,648, Cl. 55-73.000.

Bachmann, Henry C.; and Fraze, Ermal C., to Dayton Reliable Tool & Mfg. Co. Method and apparatus for fabrication a can body. 4,711,611, Cl. 413-69.000.

Bahrmann, Helmut: *See—*
Konkol, Werner; Bahrmann, Helmut; Dambkes, Georg; Gick, Wilhelm; Wiebus, Ernst; and Bach, Hanswilhelm, 4,711,648, Cl. 55-73.000.

Bailey, Rick S.; and Holly, Arthur C., to Board of Regents The University of Texas System. Sampling average phase meter. 4,712,060, Cl. 324-83.00R.

Baisch, Herbert: *See—*
Handler, Milton E.; and Baisch, Herbert, 4,711,183, Cl. 108-111.000.

Baker, Anthony P., to ITT Defense Communications, a Division of ITT Corporation. Optical interface apparatus. 4,711,529, Cl. 350-331.00R.

Baker, Steven F., to General Motors Corporation. Direct acting camvalve assembly. 4,711,202, Cl. 123-90.260.

Baker, W. Howard, to Precision Rubber Products Corporation. Turbulent flow gate for the injection molding of tubular parts, including parisons suitable for blow molding. 4,711,602, Cl. 425-206.000.

Bald, Wilfried, to SMS Schloemann-Siemag AG. Method of operating a four-high roll stand with bendable and axially shiftable rolls. 4,711,116, Cl. 72-366.000.

Baldenko, Dmitry F.; Bezlepkin, Nikolai P.; Vadetsky, Jury V.; Gusman, Moisei T.; Potapov, Jury F.; and Semenets, Valery I., to Vsesojuzny Nauchnoisledovatelsky Institut Burovoi Tekhniki. Downhole sectional screw motor, mounting fixture thereof and method of oriented assembly of working members of the screw motor using the mounting fixture. 4,711,006, Cl. 29-156.40R.

Baldwin, Paul L.: *See—*
Orndorff, Karl B.; and Baldwin, Paul L., 4,711,322, Cl. 187-1.00R.

Baldwin, Richard R., to Hewlett-Packard Company. Minimum deadpath interferometer and dilatometer. 4,711,574, Cl. 356-349.000.

Bally Manufacturing Corporation: *See—*
Pajak, Phillip; Salmons, Victor; and Chan, Tony, 4,711,451, Cl. 273-143.00R.

Balmer, Oskar: *See—*
Focke, Heinz; and Balmer, Oskar, 4,711,349, Cl. 206-260.000.

Baltes, Horst: *See—*
Schrom, Ralf-H.; and Baltes, Horst, 4,711,493, Cl. 297-379.000.

Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, to BASF Aktiengesellschaft. Magnetic tape cassette with equalization of electrostatic charges. 4,712,148, Cl. 360-132.000.

Ban, Itsuki; and Mitsuta, Yuji. Blind person guide device. 4,712,003, Cl. 250-221.000.

Ban, Mikichi, to Canon Kabushiki Kaisha. Wave front aberration measuring apparatus. 4,711,576, Cl. 356-353.000.

Bandurco, Victor T.; Schwender, Charles F.; Falotico, Robert; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. Substituted 3-(4-phenyl-1-piperazinyl)alkylquinazolin-2,4-(1H,3H) diones, methods of preparation, compositions and method of use. 4,711,883, Cl. 514-253.000.

Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, to EPIS S.A. α, ω-dicarboxylic acids and medicaments which contain these compounds. 4,711,896, Cl. 514-570.000.

Barbe, Christian; and Barbe, Richard. Wallpaper applicator devices and method for its use. 4,711,682, Cl. 156-71.000.

Barbe, Richard: *See—*
Barbe, Christian; and Barbe, Richard, 4,711,682, Cl. 156-71.000.

Bardhan, Pronob, to Corning Glass Works. Stabilized ferroelectrics. 4,712,156, Cl. 361-321.000.

Barker, Roger N.: *See—*
Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., 4,711,834, Cl. 430-201.000.

Barlow, Arthur J.: *See—*
Duncan, William; and Barlow, Arthur J., 4,711,971, Cl. 136-211.000.

Barmag Aktiengesellschaft: *See—*
Gathmann, Egon, 4,711,647, Cl. 55-52.000.

Barnhart, Gary A.: *See—*
Carson, David E.; and Barnhart, Gary A., 4,711,338, Cl. 198-396.000.

Barnthaler, Franz; Bedenk, Ferdinand; Schetina, Otto; and Zitz, Alfred, to Voest-Alpine Aktiengesellschaft. Apparatus for cutting excavations having a substantially planar face. 4,711,502, Cl. 299-33.000.

Barr, John D.; and Lamb, Haydn R., to NL Industries, Inc. Drill bit and method of manufacture. 4,711,144, Cl. 76-108.00A.

Barrington, Claud C.: *See—*
Wafer, Don B.; and Barrington, Claud C., 4,711,262, Cl. 137-14.000.

Barry, Joseph A.; and Barry, Leo J. Telescopic chute for mixer discharge. 4,711,334, Cl. 193-6.000.

Barry, Leo J.: *See—*
Barry, Joseph A.; and Barry, Leo J., 4,711,334, Cl. 193-6.000.

Barstow, Kenneth T. Coreholder. 4,711,406, Cl. 242-72.00R.

Barth, Merlyn W.: *See*—
Kosednar, Joseph F.; and Barth, Merlyn W., 4,711,993, Cl. 235-380.000.

Bartlett, Maynard L., to Arthur G. Russell Company, Inc., The. Article feeder ring for use in a vibratory bowl feeder. 4,711,337, Cl. 198-391.000.

Barvinko, Jury P.: *See*—
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.

Bary, Renate: *See*—
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Baschang, Gerhard; Hartmann, Albert; and Wacker, Oskar, to Ciba-Geigy Corporation. Acylated sugar derivatives, processes for their manufacture, and their use. 4,711,879, Cl. 514-42.000.

BASF Aktiengesellschaft: *See*—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,712,148, Cl. 360-132.000.
Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, 4,711,930, Cl. 502-209.000.
Sterzel, Hans-Josef; and Sanner, Axel, 4,711,907, Cl. 521-27.000.

Basile, Philip C., to RCA Corporation. Bias control circuit for RF switch. 4,712,020, Cl. 307-256.000.

Baskett, Ira E., to Motorola, Inc. Current steering differential write circuit for memory cells. 4,712,193, Cl. 365-190.000.

Bass, Edmund P.; and Sharpee, Richard L., to Norden Laboratories, Inc. Inactivated rabies vaccine for veterinary use. 4,711,778, Cl. 424-89.000.

Battelle Memorial Institute: *See*—
Pau, Louis F., 4,712,057, Cl. 324-73.00R.
Verber, Carl M., 4,712,089, Cl. 340-347.0AD.

Baugh, John L.; and Foster, Joe, to Hughes Tool Company. Slip gripping mechanism. 4,711,326, Cl. 188-67.000.

Baxter Travenol Laboratories, Inc.: *See*—
Leigh, Harold G.; and Schachet, Eli, 4,711,637, Cl. 604-220.000.
White, Leonard A.; and Carveth, Peter C., 4,711,359, Cl. 215-11.100.

Bayer Aktiengesellschaft: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.
Heidenreich, Holger; and Wolfrum, Gerhard, 4,711,954, Cl. 534-780.000.
Kluth, Joachim; Muller, Klaus-Helmut; and Pfister, Theodor, 4,711,959, Cl. 544-320.000.
Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,711,657, Cl. 71-92.000.
Kubitza, Werner; and Mennicken, Gerhard, 4,711,918, Cl. 524-196.000.
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Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,711,905, Cl. 514-522.000.
Wolff, Joachim; and Wolf, Karlheinz, 4,711,642, Cl. 8-527.000.

Bayerische Motoren Werke AG: *See*—
Seidl, Jiri, 4,711,203, Cl. 123-90.340.

Baylor College of Medicine: *See*—
Kit, Malon; and Kit, Saul, 4,711,850, Cl. 435-235.000.

Bazilio, Rayman E.; Hartz, James F.; and Uliana, Anthony R., to General Motors Corporation. Hydrodynamic retarder with a centrifugal accumulator. 4,711,328, Cl. 188-296.000.

Bea, Clifford F.: *See*—
Hannah, Daniel E.; Miliczky, Eugene W.; Bea, Clifford F.; and Hannah, Martin J., 4,711,013, Cl. 29-402.020.

Beach, David L.; and Harrison, James J., to Chevron Research Company. Oligomerization of ethylene in methanol and water. 4,711,969, Cl. 585-511.000.

Beckenbauer, Thomas: *See*—
Zwicker, Eberhard; Beckenbauer, Thomas; and Beer, Guenther, 4,712,244, Cl. 381-68.100.

Becker-Ross, Helmut: *See*—
Quillfeldt, Winfried; Naumann, Bernd; and Becker-Ross, Helmut, 4,711,572, Cl. 356-311.000.

Beckett, Christine A.: *See*—
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., 4,711,727, Cl. 210-727.000.

Beckman Instruments, Inc.: *See*—
Wijntjes, Geert; and Hercher, Michael, 4,711,573, Cl. 356-346.000.

Bedenk, Ferdinand: *See*—
Barnthaler, Franz; Bedenk, Ferdinand; Schetina, Otto; and Zitz, Alfred, 4,711,502, Cl. 299-33.000.

Bednar, Fred H., to Westinghouse Electric Corp. Method and apparatus for impacting a surface with a controlled impact energy. 4,711,754, Cl. 376-245.000.

Bedsole, Jaye M. Hands-free clamping device for holding fish or game for cleaning. 4,711,000, Cl. 17-70.000.

Beer, Guenther: *See*—
Zwicker, Eberhard; Beckenbauer, Thomas; and Beer, Guenther, 4,712,244, Cl. 381-68.100.

Beisel, Hermann, to Heidelberger Druckmaschinen AG. Device for engaging and disengaging the form rollers in an inking unit of a printing machine. 4,711,174, Cl. 101-352.000.

Belfer-Canterman, Sofia: *See*—
Streat, Michael; and Belfer-Canterman, Sofia, 4,711,863, Cl. 502-5.000.

Bell, Vernon L., to United States of America, National Aeronautics and Space Administration. Polyether-polyester graft copolymer. 4,711,932, Cl. 525-397.000.

Below, Randy; Burke, Howard; and Thomas, Stephen M., to Siemon Company, The. Multi-purpose modular jack connecting block. 4,712,234, Cl. 379-399.000.

Benford, James G., to Allegheny Ludlum Corporation. Apparatus for reducing core losses of grain-oriented silicon steel. 4,711,113, Cl. 72-197.000.

Bennett, Robert, to KJS Industries, Inc. Article dispenser for lipstick or the like. 4,711,354, Cl. 206-385.000.

Bennett, Roger F. C., to Westinghouse Brake and Signal Co., Ltd. Semiconductor devices having contact arrangement. 4,712,128, Cl. 357-79.000.

Benson, John E.: *See*—
Marcus, Michael A.; and Benson, John E., 4,711,808, Cl. 428-336.000.

Benyon, John F.: *See*—
Harris, John L.; and Benyon, John F., 4,711,435, Cl. 267-221.000.

Berchem, Donald J.; and Meininger, James R., to Chrysler Motors Corporation. Liquid cooled exhaust manifold. 4,711,088, Cl. 60-321.000.

Berchem, Rutger; and Proksch, Georg, to Berchem & Schaberg GmbH. Replaceable tooth for a digging and breaking tool. 4,711,503, Cl. 299-79.000.

Berchem, Rutger, to Berchem & Schaberg GmbH. Rotating cutter head. 4,711,504, Cl. 299-86.000.

Berchem & Schaberg GmbH: *See*—
Berchem, Rutger; and Proksch, Georg, 4,711,503, Cl. 299-79.000.
Berchem, Rutger, 4,711,504, Cl. 299-86.000.

Berger, Heinz: *See*—
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Berglund, Per Roode. Non-contact web tension meter. 4,711,133, Cl. 73-862.070.

Bergmann, Rolf: *See*—
Hausberg, Hans-Heinrich; Bottcher, Henning; Seyfried, Christoph; and Bergmann, Rolf, 4,711,893, Cl. 514-339.000.

Bergsma, Wijtse; and Oord, Klaas T., to U.S. Philips Corporation. Dry-shaving apparatus with a holder for circular cutting units. 4,711,028, Cl. 30-43.600.

Berke, Michael; and Rosman, Matthew. Chiropractic adjustment device. 4,711,230, Cl. 128-69.000.

Bernardini, Allen J., to Litton Systems, Inc. Fiber optic connector backshell. 4,711,520, Cl. 350-96.200.

Bernet, Jean M.: *See*—
d'Humieres, Etienne; Bernet, Jean M.; and Imhoff, Claude, 4,712,001, Cl. 250-213.0VT.

Bernhardt, Richard P.; and Bowman, Robert L., to New Holland Inc. Method and apparatus for mounting concaves. 4,711,252, Cl. 130-27.00S.

Berryhill, Robert A., to Austin-Berryhill Fabrication, Inc. Air filter and method. 4,711,649, Cl. 55-97.000.

Bertin & Cie: *See*—
Viannay, Stephane G. J.; Roth, Bernard M.; Mirigay, Solange M. V.; and Chastang, Georges J. B., 4,711,431, Cl. 266-114.000.

Besik, Ferdinand. Apparatus for sorption dehumidification and cooling of moist air. 4,711,097, Cl. 62-271.000.

Bevier, William E.: *See*—
Acharya, Arun; and Bevier, William E., 4,711,646, Cl. 55-33.000.

Bezlepkin, Nikolai P.: *See*—
Baldenko, Dmitry F.; Bezlepkin, Nikolai P.; Vadetsky, Jury V.; Gusman, Moisei T.; Potapov, Jury F.; and Semenets, Valery I., 4,711,006, Cl. 29-156.40R.

Bhatia, Harsaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., to International Business Machines Corporation. Structure for contacting a narrow width PN junction region. 4,712,125, Cl. 357-59.000.

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Oswald, Alexis A.; and Bhatia, Ram N., 4,711,968, Cl. 568-454.000.

Bhatia, Satyapal S.: *See*—
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Bibber, John W., to Sanchem, Inc. Corrosion resistant aluminum coating. 4,711,667, Cl. 106-14.210.

Bierhoff, Martinus P. M.: *See*—
Schoofs, Franciscus A. C. M.; Bierhoff, Martinus P. M.; Van Mil, Job F. P.; and Slomp, Albert H., 4,712,091, Cl. 340-347.0DA.

Bierman, Steven F. Catheterization system. 4,711,636, Cl. 604-180.000.

Biffar, Werner: *See*—
Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, 4,711,930, Cl. 502-209.000.

Bilas, Michael. Wheel lift. 4,711,464, Cl. 280-704.000.

Bilek, Andrew G.: *See*—
Foster, Joseph C., Jr.; and Bilek, Andrew G., 4,711,177, Cl. 102-204.000.

Biletsky, Semen M.: *See*—
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.

Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., to General Motors Corporation. Ultrasonic method and apparatus for spot weld control. 4,711,984, Cl. 219-110.000.

Binden, John A., to Northrop Corporation. X-wing helicopter-scout attack configuration. 4,711,415, Cl. 244-17.190.

Binder, Werner: *See—*
Dettelbach, Alfred; and Binder, Werner, 4,711,147, Cl. 83-863.000.

Bioetica, S.A.: *See—*
Huc, Alain; Gimeno, Rene; and Herbage, Daniel, 4,711,783, Cl. 424-460.000.

Biokinetics, Inc.: *See—*
Steuer, Robert R.; and Harris, David H., 4,711,248, Cl. 128-748.000.

Birring, Anmol S.: *See—*
Kwun, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.

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Blair, Preston E.; and Preston, Frank S. TV animation interactively controlled by the viewer. 4,711,543, Cl. 352-87.000.

Blakeney, Robert D., II: *See—*
Gilhousen, Klein S.; Heller, Jerrold A.; Van Harding, Michael; and Blakeney, Robert D., II, 4,712,238, Cl. 380-20.000.

Blaushild, Ronald M., to Westinghouse Electric Corp. Nuclear reactor incorporating locking device for threaded bolt connections. 4,711,760, Cl. 376-399.000.

Blohm & Voss AG: *See—*
Latza, Joachim; and Mock, Gunther, 4,711,193, Cl. 114-211.000.

Blount, David H. Process for the production of phenolic resins. 4,711,911, Cl. 521-123.000.

Blue Circle Industries, PLC: *See—*
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., 4,711,727, Cl. 210-727.000.

Blumcraft of Pittsburgh: *See—*
Horgan, William J., Jr., 4,711,480, Cl. 292-336.300.

Board of Regents The University of Texas System: *See—*
Bailey, Rick S.; and Holly, Arthur C., 4,712,060, Cl. 324-83.00R.

Boardman Molded Products, Inc.: *See—*
Ullman, Myron, 4,711,360, Cl. 215-235.000.

Bobo, Roy A. Gas lift system. 4,711,306, Cl. 166-372.000.

BOC Group, Inc., The: *See—*
Jacobson, Stephen E., 4,711,772, Cl. 423-584.000.
Wiseman, Charles D.; and Theisen, William M., 4,711,791, Cl. 427-96.000.

Bochi, Hiroshi: *See—*
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.

Bock, Lawrence A.: *See—*
Pastorino, Ronald L.; and Bock, Lawrence A., 4,711,909, Cl. 521-69.000.

Bodnar, Thomas R. Flanged valve connectors. 4,711,426, Cl. 251-151.000.

Boeing Company, The: *See—*
Archung, Ralph, 4,711,089, Cl. 60-405.000.
Dunn, Michael J., 4,711,414, Cl. 244-3.220.

Boeke, Eric J.; and McCoy, Milton E., to Camco, Incorporated. Method of and apparatus for injection of steam into multiple well zones. 4,711,304, Cl. 166-303.000.

Bogar, Gerald D. Bookcover and binding method. 4,711,469, Cl. 281-25.00A.

Bojanowski, Gerald M.: *See—*
Knable, Joseph J.; Ferdelman, Donald C.; and Bojanowski, Gerald M., 4,711,463, Cl. 280-668.000.

Boldridge, Austin, Jr.; Buell, Scott; and Graham, James M., to Gellman, Aaron J.; and Levinson, Samuel H. Parallel encoded piezoelectric keyboard switch and array. 4,712,092, Cl. 340-365.00A.

Boldt, Robert R., to East Moline Metal Products Company. Controller with two modes of braking induction motors. 4,712,054, Cl. 318-758.000.

Bolin, Philip C.: *See—*
Meyer, Jeffry R.; Munroe, Albert P.; and Bolin, Philip C., 4,711,973, Cl. 174-14.00R.

Bolson, John H., Sr., to Minnesota Mining and Manufacturing Company. Self-orienting passive marker structure. 4,712,094, Cl. 340-572.000.

Bolt Technolgy Corporation: *See—*
Chelminski, Stephen V., 4,712,202, Cl. 367-144.000.

Bonko, Mark L.; and Lopp, Loran C., Jr., to Goodyear Tire & Rubber Company, The. Heavy duty pneumatic tire tread with lug and block pattern. 4,711,283, Cl. 152-209.00B.

Bonvallet, Duane J., to General Motors Corporation. Valve deactivator mechanism. 4,711,207, Cl. 123-198.00F.

Boon, Charles W. Roll lifting, transporting, and unrolling dolly system and method. 4,711,407, Cl. 242-86.520.

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Borsh, Richard J., to Carlon Company, The. Adapter fitting for connecting flexible conduit to electrical outlet boxes. 4,711,974, Cl. 174-65.00R.

Bosley, Sydney S. Blade fuse assembly with indicator. 4,712,081, Cl. 337-266.000.

Bossard, Peter R.; and Mucha, John A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Detection of water entrapped in electronic components. 4,711,118, Cl. 73-73.000.

Bottcher, Henning: *See—*
Hausberg, Hans-Heinrich; Bottcher, Henning; Seyfried, Christoph; and Bergmann, Rolf, 4,711,893, Cl. 514-339.000.

Bouchez, Jean-Pierre: *See—*
Jamonet, Bernard; Rigouard, Alain; Bouchez, Jean-Pierre; and Duc, Jean, 4,711,721, Cl. 210-607.000.

Boura, Andre , to Societe Francaise d'Equipements pour la Aerienne (S.F.E.N.A.). Micromachined accelerometer with electrostatic return. 4,711,128, Cl. 73-517.00B.

Bowman, Robert L.: *See—*
Bernhardt, Richard P.; and Bowman, Robert L., 4,711,252, Cl. 130-27.00S.

Brand, Harold E. Inflatable infant seat. 4,711,490, Cl. 297-250.000.

Brandes, Wilhelm: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,711,657, Cl. 71-92.000.

Brandt, Inc.: *See—*
Taylor, Lawrence D., 4,711,441, Cl. 271-6.000.

Branigan, John T.; and Vess, David J., to General Dynamics, Pomona Division. Five-port monopulse antenna feed structure with one dedicated transmit port. 4,712,110, Cl. 343-779.000.

Branson, Christopher W.; and Sullivan, Steven K., to Tektronix, Inc. Active load network. 4,712,058, Cl. 324-23.00R.

Branson Ultrasonics Corp.: *See—*
Holze, Ernest P., Jr., 4,711,693, Cl. 156-580.100.

Braudaway, Gordon W.: *See—*
Meltzer, Clifford B.; Kannan, Krishnamurthi; Burket, Thomas G.; Kruesi, Deborah J.; and Braudaway, Gordon W., 4,712,214, Cl. 371-32.000.

Bray, Donald T., to Nimbus Water Systems, Inc. Water purification system. 4,711,723, Cl. 210-652.000.

Brazier, William A.: *See—*
Ganderton, Alfred D.; and Brazier, William A., 4,711,398, Cl. 239-167.000.

Breck, Donald W., deceased: *See—*
Skeels, Gary W.; and Breck, Donald W., deceased, 4,711,770, Cl. 423-328.000.

Breck, Stephen R., George D. Breck, heirs: *See—*
Skeels, Gary W.; and Breck, Donald W., deceased, 4,711,770, Cl. 423-328.000.

BRECO Kunstsoffverarbeitungs-GmbH & Co. KG: *See—*
Breher, Rudolf; and Kolling, Rudi, 4,711,346, Cl. 198-844.000.

Breed, Allen K., to Breed Corporation. Method and apparatus for gas generator initiation from external sensor. 4,711,466, Cl. 280-741.000.

Breed Corporation: *See—*
Breed, Allen K., 4,711,466, Cl. 280-741.000.

Breher, Rudolf; and Kolling, Rudi, to BRECO Kunstsoffverarbeitungs-GmbH & Co. KG. Plastic conveyor belt with extension-resistant reinforcement and drive gearing. 4,711,346, Cl. 198-844.000.

Bretthauer, Hans-Jurgen: *See—*
Focke, Heinz; Langer, Horst; and Bretthauer, Hans-Jurgen, 4,711,065, Cl. 53-170.000.

Brickner, Louis C., Jr.: *See—*
Rickmers, Clifford P.; Donovan, Robert D.; and Brickner, Louis C., Jr., 4,711,032, Cl. 30-372.000.

Bridgestone Corporation: *See—*
Ogawa, Masaki; and Kudo, Takabumi, 4,711,285, Cl. 152-458.000.
Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased; and Murakamai, Yuichi, 4,711,870, Cl. 502-303.000.

Briggs, Malcolm T.; Dowell, Robert I.; and Thornber, Craig W., to Imperial Chemical Industries PLC. Hydrazinopyridazine compounds. 4,711,887, Cl. 514-247.000.

Brinigar, William S.: *See—*
Arkles, Barry C.; and Brinigar, William S., 4,711,820, Cl. 428-429.000.

Brison, Bernard; Galerneau, Jacques; Gontier, Alex; and Petrozzi, Gerard. Protecting garnment usable in particular in hairdressing salons and new type of towel incorporated in the design of said garnment. 4,710,980, Cl. 2-50.000.

British Petroleum Company p.l.c., The: *See—*
Callaghan, Ian C.; Gould, Clive M.; and Grabowski, Wojciech, 4,711,714, Cl. 208-348.000.

Brockett, Walter D., to Avco Corporation. Ejector assisted compressor bleed. 4,711,084, Cl. 60-39.070.

Broekhuizen, Willem: *See—*
Koeling, Thijs; Lehr, Bernd C.; and Broekhuizen, Willem, 4,711,303, Cl. 166-250.000.

Brombacher, Urs; Link, Helmut; and Montavon, Marc, to Hoffman-La Roche Inc. Schistosomicidal acridanone hydrazones. 4,711,889, Cl. 514-297.000.

Brooklyn Union Gas Company, The: *See—*
Markbreiter, Stephen J.; and Dessanti, Daniel J., 4,711,093, Cl. 62-87.000.

Brooks, Albert E. Circumferential membrane, fluid coupled catheter. 4,711,249, Cl. 128-748.000.

Brooks, Ralf M.; Connell, Brian P.; Sonnenburg, Dennis T.; and Pagowski, Stefan J., to NCR Canada Ltd - NCR Canada Ltee. Thermal transfer ribbon mechanism and recording method. 4,712,113, Cl. 346-1.100.

Brooks, Royce L., to Koerner, Norman D. Evacuation chair. 4,711,487, Cl. 297-183.000.

Brown, Anthony D., to Grundy Dispense Systems, Inc. Coupler and pump for a beverage dispenser. 4,711,377, Cl. 222-400.700.

Brown, Byron L. Method and apparatus for cementing an acetabular cup to an acetabulum. 4,711,233, Cl. 128-92.0VP.

Brown Jordan Company: *See—*
Stewart, Alva N., 4,712,166, Cl. 362-147.000.

Brown, Kevin D.: *See—*
Brown, Larry D.; and Brown, Kevin D., 4,711,482, Cl. 294-19.100.

Brown, Larry D.; and Brown, Kevin D., to N/C Industries. Reaching aid for the handicapped. 4,711,482, Cl. 294-19.100.

Brown, Reed S.; Consoli, John J.; and Klier, Richard G., to American Telephone & Telegraph Company, AT&T Information Systems Inc. Telephone handset construction. 4,712,236, Cl. 379-433.000.

Bruch, Guy. Process of vinification. 4,711,785, Cl. 426-15.000.

Bruderer, Werner, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for securing a connection. 4,711,596, Cl. 403-348.000.

Bruffey, Robert D., Jr.: *See—*
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,711,374, Cl. 222-129.100.

Brule, Gerard: *See—*
Roger, Loic; Maubois, Jean-Louis; Brule, Gerard; and Piot, Michel, 4,711,953, Cl. 530-366.000.

Bruning, Richard P.: *See—*
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Brunner, Hubert: *See—*
Pertzsch, Albert; Zeroni, Ludwig; and Brunner, Hubert, 4,712,150, Cl. 360-132.000.

Brunner, Josef; and Ritzer, Josef. Device for cleaning shellfish. 4,710,999, Cl. 17-65.000.

Brunner, Rudolf, to Heilmeier & Weinlein Fabrik fur Oel-Hydraulic GmbH & Co. KG. Hydraulic control device. 4,711,155, Cl. 91-446.000.

Brunswick Corporation: *See—*
Staerzl, Richard E., 4,711,219, Cl. 123-494.000.

Bubnis, Bernard P.: *See—*
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Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,711,657, Cl. 71-92.000.

Budniak, Mitchell: *See—*
Ritter, G. Thomas; and Budniak, Mitchell, 4,711,987, Cl. 219-358.000.

Buell, Scott: *See—*
Boldridge, Austin, Jr.; Buell, Scott; and Graham, James M., 4,712,092, Cl. 340-365.00A.

Bulka, Raymond I.; and Nowaczyk, David J., to McCain Manufacturing Corporation. Signature machine with counterpulse weight shuttle bar drive. 4,711,440, Cl. 270-53.000.

Bull, Rebecca L.; and Shupert, Kristine A. Mother's apron or bib with detachable multicolored two-dimensional infant toys to aid supervised baby play. 4,710,979, Cl. 2-48.000.

Bulman, Melvin J., to General Electric Company. Seal. 4,711,153, Cl. 89-7.000.

Burgess, James F., to General Electric Company. Circuit board construction. 4,711,804, Cl. 428-210.000.

Burggraaf, Anthonie J.: *See—*
Leenaars, Adriaan F. M.; Burggraaf, Anthonie J.; and Keizer, Klass, 4,711,719, Cl. 210-500.260.

Burgoyne, William F., Jr.; and Dixon, Dale D., to Air Products and Chemicals, Inc. N-tert-butyl derivatives of toluenediamine and mixtures as antioxidant for organic materials. 4,711,737, Cl. 252-77.000.

Burke, Howard: *See—*
Below, Randy; Burke, Howard; and Thomas, Stephen M., 4,712,234, Cl. 379-399.000.

Burket, Thomas G.: *See—*
Meltzer, Clifford B.; Kannan, Krishnamurthi; Burket, Thomas G.; Kruesi, Deborah J.; and Braudaway, Gordon W., 4,712,214, Cl. 371-32.000.

Burlington Industries, Inc.: *See—*
Newton, Feaster H.; and Wang, Kenneth Y., 4,711,079, Cl. 57-12.000.

Burns, John T., to Du Pont de Nemours, E. I., and Company. Delustered nylon fiber containing segmented striations of polypropylene. 4,711,812, Cl. 428-401.000.

Butler, Alfred L., to Litton Systems, Inc. Non-pendulous counterbalanced dither mechanism for laser gyro. 4,711,575, Cl. 356-350.000.

Butler, Scott J.; Smith, Robert K.; and Abdollahian, Mehdy, to GTE Laboratories Incorporated. Quadrature-coupled microwave electrodeless lamp. 4,712,046, Cl. 315-248.000.

Buttazzoni, Bernard: *See—*
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Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., to Imperial Chemical Industries PLC. Laser-imageable assembly and process for production thereof. 4,711,834, Cl. 430-201.000.

Buzzi, Carlo A.: *See—*
Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., 4,711,375, Cl. 222-135.000.

Byers, Timothy W.: *See—*
Ohs, Gary L.; and Byers, Timothy W., 4,711,538, Cl. 350-604.000.

C-E Industrial Lasers, Incorporated: *See—*
Latto, William, 4,712,120, Cl. 346-145.000.

Cable/Home Communication Corp.: *See—*
Gilhousen, Klein S.; Heller, Jerrold A.; Van Harding, Michael; and Blakeney, Robert D., II, 4,712,238, Cl. 380-20.000.

Cabot Corporation: *See—*
Lai, George Y., 4,711,763, Cl. 420-585.000.

Cagle, Philip V., to General Motors Corporation. Torque applier. 4,711,124, Cl. 73-162.000.

Caldwell, Donald B.; and Spring, Robert J., to Adaptable Tool Company, The. Apparatus and methods for pumping solids and undesirable liquids from a well bore. 4,711,299, Cl. 166-105.100.

Callaghan, Ian C.; Gould, Clive M.; and Grabowski, Wojciech, to British Petroleum Company p.l.c., The. Method for the separation of gas from oil. 4,711,714, Cl. 208-348.000.

Callthorp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L. Decanting apparatus. 4,711,716, Cl. 210-136.000.

Camco, Incorporated: *See—*
Boeke, Eric J.; and McCoy, Milton E., 4,711,304, Cl. 166-303.000.

Campbell, Donald N.: *See—*
Vora, Kishore N.; Carrico, John P., Sr.; Spangler, Glenn E.; Campbell, Donald N.; and Martin, Charles E., 4,712,008, Cl. 250-287.000.

Campbell, Edward N., to Dana Corporation. Vice jaw support apparatus. 4,711,439, Cl. 269-277.000.

Campbell, Roy: *See—*
Price, Anthony G.; Campbell, Roy; and Green, Andrew P., 4,711,327, Cl. 188-71.400.

Campbell, Simon F.; and Kobylecki, Ryszard J., to Pfizer Inc. Octahydro-6-azaindole compounds, compositions and use. 4,711,882, Cl. 514-228.000.

Canon Kabushiki Kaisha: *See—*
Arakawa, Kazuhiko; Terashima, Jun; and Tokura, Go, 4,711,548, Cl. 354-485.000.
Ban, Mikichi, 4,711,576, Cl. 356-353.000.
Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, 4,711,830, Cl. 430-52.000.
Hashimoto, Seiji; Kinoshita, Takao; and Tanaka, Nobuyoshi, 4,712,135, Cl. 358-213.220.
Hosaka, Masao; and Saito, Takashi, 4,711,560, Cl. 355-14.00C.
Iizuka, Kiyoshi, 4,711,547, Cl. 354-471.000.
Kanda, Shigeto, 4,712,206, Cl. 369-46.000.
Kato, Yoshiaki, 4,712,139, Cl. 358-257.000.
Kawaguchi, Fumiaki; Shimazu, Toshikazu; and Takahashi, Kazuhisa, 4,712,117, Cl. 346-108.000.
Kawanabe, Tetsuya, 4,712,072, Cl. 328-130.100.
Kikuchi, Kazuhiko; Honguu, Kazuoki; and Sawamura, Mitsuharu, 4,711,821, Cl. 428-457.000.
Kiyohara, Takehiko, 4,712,119, Cl. 346-140.00R.
Kiyohara, Takehiko; Terasawa, Koji; and Miyakawa, Akira, 4,712,172, Cl. 346-1.100.
Kyuma, Kenji; and Hieda, Teruo, 4,712,138, Cl. 358-213.310.
Matsumura, Takashi, 4,712,016, Cl. 250-548.000.
Matsushita, Takashi; Takahashi, Sadatoshi; Ikemori, Keiji; Kitagishi, Nozomu; Tanaka, Tsunefumi; and Momiyama, Kikuo, 4,711,534, Cl. 350-426.000.
Nishiyama, Masaki, 4,712,188, Cl. 364-900.000.
Nozaki, Mineo; and Asakura, Osamu, 4,711,591, Cl. 400-225.000.
Okino, Tadashi, 4,711,546, Cl. 354-425.000.
Sekine, Kazumi, 4,711,992, Cl. 235-145.00R.
Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, 4,712,118, Cl. 346-108.000.
Tanioka, Hiroshi; and Honma, Toshio, 4,711,558, Cl. 355-14.00R.
Torigoe, Makoto; Suzuki, Akiyoshi; and Sakai, Terumasa, 4,711,568, Cl. 355-68.000.
Tsunekawa, Tokuichi; and Sato, Yuichi, 4,712,136, Cl. 358-213.150.
Tsunekuni, Masao; and Ishizawa, Yasuhisa, 4,712,100, Cl. 340-710.000.
Yoshikawa, Junichi; and Rachi, Masahiro, 4,712,000, Cl. 250-205.000.

Capdebosc, Bernard, to Martin S.A. Machine having a plurality of working stations for successively processing a sheet of material running through the machine. 4,711,172, Cl. 101-152.000.

Capra, Thierry; and Gerard, Philippe, to Commissariat a l'Energie Atomique. Process for producing a layer having a high magnetic anisotropy in a ferrimagnetic garnet. 4,711,694, Cl. 156-603.000.

Capuano, Giuseppe. Acetic acid fermentation process and apparatus. 4,711,163, Cl. 99-323.120.

Card, Roger J.: *See—*
Paul, Albert P.; Szarz, Richard A.; and Card, Roger J., 4,711,669, Cl. 106-38.510.

Cargnel, Giuseppe: *See—*
Mori, Maurizio; Babuin, Piero; and Cargnel, Giuseppe, 4,711,103, Cl. 68-12.00R.

Carl Freudenberg, Firma: *See—*
Muller, Walter R., 4,711,670, Cl. 106-155.000.

Carleton, Samuel A.; and King, Norman R., to North American Philips Corporation. Connector for high pressure lamps. 4,712,040, Cl. 313-331.000.

Carlon Company, The: *See—*
Borsh, Richard J., 4,711,974, Cl. 174-65.00R.

Carlsson, Jan P. E.: *See—*
Axen, Rolf E. A. V.; and Carlsson, Jan P. E., 4,711,951, Cl. 530-323.000.

Carpenter, Willis M., to Hydra-Level, Inc. Hydraulic leveling device. 4,711,428, Cl. 254-423.000.

Carpigiani Bruto Macchine Automatiche: *See—*
Manfroni, Ezio, 4,711,376, Cl. 222-146.100.

Carr, Francis, to Siltronics Ltd. Miniature antenna with separate sequentially wound windings. 4,712,112, Cl. 343-788.000.

Carrico, John P., Sr.: *See—*
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Carroll, Bruce I. Alcohol fuel conversion apparatus. 4,711,223, Cl. 123-557.000.

Carroll, Charles. High security deadlocking door latch. 4,711,478, Cl. 292-173.000.

Carson/Burger/Weekly, Inc.: *See*—
Carson, David E.; and Barnhart, Gary A., 4,711,338, Cl. 198-396.000.

Carson, Culley: *See*—
Goldwasser, Benad; and Carson, Culley, 4,711,240, Cl. 128-319.000.

Carson, David E.; and Barnhart, Gary A., to Carson/Burger/Weekly, Inc. Lid feeding machine. 4,711,338, Cl. 198-396.000.

Carter, Malcolm N. A.; and Scowen, Reginald V., to Lever Brothers Company. Detergent compositions. 4,711,740, Cl. 252-174.240.

Cartier Industrie: *See*—
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Cartmell, Robert R.; and Horecky, Carl J., to Standard Oil Company (Indiana). Apparatus for mixing cracking catalyst with a fluid hydrocarbon. 4,711,766, Cl. 422-140.000.

Carveth, Peter C.: *See*—
White, Leonard A.; and Carveth, Peter C., 4,711,359, Cl. 215-11.100.

Case, Allen W., Jr.: *See*—
Lillquist, Robert D.; and Case, Allen W., Jr., 4,711,986, Cl. 219-130.010.

Casey, Robert F., to RCA Corporation. Chrominance signal frequency converter as for a pix-in-pix television receiver. 4,712,130, Cl. 358-22.000.

Casio Computer Co., Ltd.: *See*—
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, 4,712,243, Cl. 381-43.000.
Tanazawa, Masayoshi; Shoji, Masaru; and Yamada, Wataru, 4,711,584, Cl. 368-88.000.
Uesugi, Yoshinori, 4,712,196, Cl. 365-229.000.

Cassou, Jean-Pierre, to Institut Francais du Petrole. Device for processing modulated signals received by a lateral sonar system. 4,712,200, Cl. 367-88.000.

Castolin S.A.: *See*—
Oeschsle, Manfred; Szieslo, Uwe; Streb, Karl-Peter; and Simm, Wolfgang, 4,711,627, Cl. 431-30.000.

Castricum, Wilhelmus P. H., to Spiro America Inc. Apparatus for crimping pipe. 4,711,110, Cl. 72-49.000.

Catapano, Salvatore J. Process for the treatment and remission of AIDS (acquired immune deficiency syndrome). 4,711,876, Cl. 514-2.000.

Caterpillar Industrial Inc.: *See*—
Erker, James W.; Scotese, Michael J.; and Stotts, Jay B., 4,711,614, Cl. 414-641.000.

Cates, Marion H.; and Szonntagh, Eugene L., to Honeywell Inc. Sorption/desorption gas analysis apparatus. 4,711,765, Cl. 422-89.000.

Cegelec Industrie Inc.: *See*—
Jeanjean, Robert; Demissy, Daniel; Saint-Jean, Guy; and Landry, Michel, 4,711,978, Cl. 200-148.00A.

Cellai, Marino: *See*—
Colombo, Piero; Cellai, Marino; and Cognetti de Martiis, Carlo, 4,712,127, Cl. 357-72.000.

Celotex Corporation, The: *See*—
Snider, Scott C.; and DeLeon, Alberto, 4,711,912, Cl. 521-125.000.

Central Glass Company Limited: *See*—
Aramaki, Minoru; and Sakaguchi, Hiroaki, 4,711,949, Cl. 525-356.000.

Central Sprinkler Corporation: *See*—
Polan, George S.; and Glinecke, Hermann R., 4,711,099, Cl. 62-457.000.

Centre National d'Etudes Spatiales (C.N.E.S): *See*—
Regipa, Robert, 4,711,416, Cl. 244-31.000.

Cerny, Martin: *See*—
Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri ; and Rovensky, Jozef, 4,711,952, Cl. 530-327.000.

Cetrone, Vincent B. Tubular overhead lighting system. 4,712,165, Cl. 362-147.000.

Cetus Corporation: *See*—
Chang, Shing, 4,711,843, Cl. 435-68.000.
Chang, Shing, 4,711,844, Cl. 435-317.100.
Gelfand, David H.; and Lawyer, Frances C., 4,711,845, Cl. 435-68.000.

Chaimowicz, Jean-Claude A., to National Research Development Corporation. Optical displacement sensors. 4,711,578, Cl. 356-375.000.

Chan, Tony: *See*—
Pajak, Phillip; Salmons, Victor; and Chan, Tony, 4,711,451, Cl. 273-143.00R.

Chang, A-Shen, to Joanna Western Mills Company. Method and apparatus for making slats for window blinds and the like from a continuous web of plastic material. 4,711,005, Cl. 29-24.500.

Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Catalytic conversion. 4,711,970, Cl. 585-415.000.

Chang, Shing, to Cetus Corporation. Method and vector organism for controlled accumulation of cloned heterologous gene products in *Bacillus subtilis*. 4,711,843, Cl. 435-68.000.

Chang, Shing, to Cetus Corporation. Modified signal peptides. 4,711,844, Cl. 435-317.100.

Chapman, Lloyd R.; and Holcombe, Cressie E., Jr., to ZYP Coatings, Inc. Oxidation prevention coating for graphite. 4,711,666, Cl. 106-14.120.

Chapman, M. J.: *See*—
Rossborough, Richard F.; and Whitty, Graeme, 4,711,258, Cl. 134-138.000.

Charbonnages de France: *See*—
Marget, Christian; and Rose, Gerard, 4,712,153, Cl. 361-91.000.

Charbonneau, Arthur G.; Godfrey, Dwaine A.; McNennamy, John A.; and Nafziger, Steven, to Charbonneau & Godfrey Associates. Motor operated valve analysis and testing system. 4,712,071, Cl. 324-415.000.

Charbonneau & Godfrey Associates: *See*—
Charbonneau, Arthur G.; Godfrey, Dwaine A.; McNennamy, John A.; and Nafziger, Steven, 4,712,071, Cl. 324-415.000.

Charen, Grace M.: *See*—
Gulette, Ronald S.; and Charen, Grace M., 4,711,483, Cl. 296-97.00C.

Chastang, Georges J. B.: *See*—
Viannay, Stephane G. J.; Roth, Bernard M.; Mirigay, Solange M. V.; and Chastang, Georges J. B., 4,711,431, Cl. 266-114.000.

Chavdarova, Vesselina B: *See*—
Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Vesselina B; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.

Cheetah Control, Inc.: *See*—
Culver, Craig F., 4,712,101, Cl. 340-710.000.

Chef Francisco, Inc.: *See*—
Dunden, Walter J., 4,711,356, Cl. 206-503.000.

Chelminski, Stephen V., to Bolt Technolgy Corporation. Method and apparatus for converting an air gun into a hydro gun for marine seismic impulse generation. 4,712,202, Cl. 367-144.000.

Chemische Fabrik Stockhausen GmbH: *See*—
Peppmoller, Reinmar; and Koschier, Friedlieb, 4,711,919, Cl. 524-77.000.

Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., to Mobil Oil Corporation. Process for making improved lubricating oils from heavy feedstock. 4,711,710, Cl. 208-111.000.

Chen, Shin-I. Pressure cooker. 4,711,366, Cl. 220-316.000.

Chen, Te H.; Cicchino, Dominic; and Shadbolt, Peter J., to Exxon Research and Engineering Company. Refractory anchor. 4,711,186, Cl. 110-336.000.

Chen, Tsai A. Automatic machine for making stone fruit biscuit. 4,711,166, Cl. 99-353.000.

Cheng, Li-Jen, to United States of America, National Aeronautics and Space Administration. Tailorable infrared sensing device with strain layer superlattice structure. 4,711,857, Cl. 437-3.000.

Chevron Research Co.: *See*—
Angehrn, Jorg A.; and Fischer, Dennis J., 4,711,122, Cl. 73-151.000.
Beach, David L.; and Harrison, James J., 4,711,969, Cl. 585-511.000.

Chew, Weng C.: *See*—
Clark, Brian; and Chew, Weng C., 4,712,070, Cl. 324-338.000.

Chikashige, Kiyoshi, to Clarion Co., Ltd. Tape transport cylinder with stress-relieved bearing recess. 4,712,147, Cl. 360-130.240.

Chinone, Naoki: *See*—
Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, 4,712,218, Cl. 372-38.000.

Cho, Masamichi: *See*—
Tomohisa, Kunio; Cho, Masamichi; and Kurusu, Yasuo, 4,712,141, Cl. 358-280.000.

Choe, Eui W., to Hoechst Celanese Corporation. Novel diacetylenic and polydiacetylenic compositions. 4,711,532, Cl. 350-354.000.

Chokai, Shoichi: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.

Cholin, Jeffrey G.: *See*—
Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, 4,712,096, Cl. 340-590.000.

Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, to Firetek Corporation. Condition responsive detection system and method. 4,712,096, Cl. 340-590.000.

Choong, John: *See*—
Magid, Robert; and Choong, John, 4,711,595, Cl. 403-108.000.

Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., to Westinghouse Electric Corp. Metal core printed circuit boards. 4,711,822, Cl. 428-458.000.

Christe, Karl O., to Rockwell International Corporation. Pure fluorine gas generator. 4,711,680, Cl. 149-109.400.

Christensen, Jon B., to Halliburton Company. Bundle type downhole gauge carrier. 4,711,123, Cl. 73-151.000.

Christenson, Roger M.: *See*—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.

Christine, William C., to Trinity Foundation. Portable dispensing system. 4,711,373, Cl. 222-82.000.

Christini, Theodore P., to Du Pont de Nemours, E. I., and Company. X-ray intensifying screen with improved topcoat. 4,711,827, Cl. 428-690.000.

Christopher, Earl H.: *See*—
Faria, Lawrence E.; and Christopher, Earl H., 4,711,650, Cl. 62-6.000.

Chrysler Motors Corporation: *See*—
Berchem, Donald J.; and Meininger, James R., 4,711,088, Cl. 60-321.000.

Chryssomallis, George; and Griffing, Robert S., to FMC Corporation. Combustion augmented plasma pressure amplifier. 4,711,154, Cl. 89-7.000.

Chuo Hatsujo Kabushiki Kaisha: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,711,675, Cl. 148-144.000.

Ciba Corning Diagnostics Corp.: *See*—
Feinberg, Richard R., 4,711,855, Cl. 436-500.000.

Ciba-Geigy Corporation: *See*—
Baschang, Gerhard; Hartmann, Albert; and Wacker, Oskar, 4,711,879, Cl. 514-42.000.
Stahl, Peter H.; and Schmitz, Beat, 4,711,880, Cl. 514-108.000.

Cicchino, Dominic: *See*—
Chen, Te H.; Cicchino, Dominic; and Shadbolt, Peter J., 4,711,186, Cl. 110-336.000.

Cincinnati Milacron Inc.: *See*—
Wilkerson, James R., 4,711,985, Cl. 219-121.0LB.

Cinpinski, Kenneth J., to General Motors Corporation. LPP combustion control for IC engine with abnormal combustion. 4,711,215, Cl. 123-425.000.

Citizen Watch Co., Ltd.: *See*—
Masubuchi, Sadao, 4,711,531, Cl. 350-350.00S.

Claassen, George R.: *See*—
Frank, Robert G.; Claassen, George R.; Waterloo, Thomas L.; Schultz, Stephen J.; and Fecik, Michael T., 4,711,653, Cl. 65-106.000.

Clarion Co., Ltd.: *See*—
Chikashige, Kiyoshi, 4,712,147, Cl. 360-130.240.

Clark, Brian; and Chew, Weng C., to Schlumberger Technology Corporation. Apparatus for microinductive investigation of earth formations. 4,712,070, Cl. 324-338.000.

Clark Equipment Company: *See*—
Link, David H.; and Lopez, Juan R., 4,711,467, Cl. 280-785.000.

Clark, James P.: *See*—
Wenzel, Bruce E.; and Clark, James P., 4,711,894, Cl. 514-458.000.

Clemens, Donald L., to Thermalloy Incorporated. Heat sink clip assembly. 4,712,159, Cl. 361-386.000.

Clement, Gene R., to Knape & Vogt Manufacturing Company. Sequential drawer slide. 4,711,588, Cl. 384-18.000.

Clish, Robert J., to International Paper Company. Filler nozzle with capillary action and its method of operation. 4,711,277, Cl. 141-311.00A.

Closmann, Philip J.: *See*—
Zemel, Bernard; and Closmann, Philip J., 4,712,006, Cl. 250-269.000.

Clough, Douglas O., to Hollingsworth UK, Ltd. Friction spinning apparatus. 4,711,083, Cl. 57-301.000.

Coal Industry (Patents) Limited: *See*—
Napier, Brian A.; and Fisher, Maurice J., 4,711,039, Cl. 34-57.00A.

Coalair Systems: *See*—
Wynosky, Charles E.; and Mraz, Joseph, 4,711,607, Cl. 406-30.000.

Coca-Cola Company, The: *See*—
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,711,374, Cl. 222-129.100.

Cocito, Giuseppe, to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and apparatus for measuring the softening point of a vitreous specimen. 4,711,587, Cl. 374-16.000.

Codino, Leno. Lasagna product. 4,711,165, Cl. 99-353.000.

Cognetti de Martiis, Carlo: *See*—
Colombo, Piero; Cellai, Marino; and Cognetti de Martiis, Carlo, 4,712,127, Cl. 357-72.000.
Marchini, Giuseppe; and Cognetti De Martiis, Carlo, 4,711,023, Cl. 29-827.000.

Coherent, Inc.: *See*—
Hennings, David; and Manoukian, Nubar, 4,711,526, Cl. 350-170.000.

Coin Acceptors, Inc.: *See*—
Houserman, Raymond L., 4,712,049, Cl. 318-112.000.

Coleman, Edward R. Valve manifold. 4,711,268, Cl. 137-597.000.

Coleman, John D., to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for use in producing reconsolidated wood products. 4,711,684, Cl. 156-196.000.

Coleman, John D., to Commonwealth Scientific and Industrial Research Organization. Process for reconsolidated wood production. 4,711,689, Cl. 156-257.000.

Colombo, Piero; Cellai, Marino; and Cognetti de Martiis, Carlo, to SGS-ATES Componenti Elettronici SpA. High reliability metal and resin container for a semiconductor device. 4,712,127, Cl. 357-72.000.

Colt Industries Inc.: *See*—
Sundberg, Jack G.; and Noell, Godwin L., 4,711,619, Cl. 418-27.000.

Commissariat a l'Energie Atomique: *See*—
Capra, Thierry; and Gerard, Philippe, 4,711,694, Cl. 156-603.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Coleman, John D., 4,711,684, Cl. 156-196.000.
Coleman, John D., 4,711,689, Cl. 156-257.000.

Computer Poet Corporation: *See*—
Minkler, Jackson D., II, 4,712,174, Cl. 364-200.000.

Confessore, Fred: *See*—
McNamara, Thomas F.; and Confessore, Fred, 4,711,851, Cl. 435-287.000.

Connell, Brian P.: *See*—
Brooks, Ralf M.; Connell, Brian P.; Sonnenburg, Dennis T.; and Pagowski, Stefan J., 4,712,113, Cl. 346-1.100.

Connors, Grant R.: *See*—
Feilchenfeld, Michal M.; and Connors, Grant R., 4,711,757, Cl. 376-258.000.

Conrad, Kenneth C., to Westinghouse Electric Corp. Method and apparatus for installing free standing turbine blades. 4,711,007, Cl. 29-156.80R.

Conroy, Gary M.: *See*—
Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., 4,711,920, Cl. 524-178.000.

Consoli, John J.: *See*—
Brown, Reed S.; Consoli, John J.; and Klier, Richard G., 4,712,236, Cl. 379-433.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Menell, Hans; Ringhoff, Hubert; and Rump, Jurgen, 4,711,691, Cl. 156-415.000.

Copal Electronics Co., Ltd.: *See*—
Okazaki, Atsushi; Igarashi, Masahiko; and Horie, Tsuneo, 4,712,084, Cl. 338-184.000.

Copeland, James L., to Ecolab Inc. Mechanical dishwashing rinse composition having a low foaming sulfonic acid rinsing agent and a source of active halogen. 4,711,738, Cl. 252-95.000.

Copp, Warren K., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the. Aircrew headgear ejection means. 4,711,411, Cl. 244-1.00R.

Cordis Corporation: *See*—
Harris, Donald L., 4,711,027, Cl. 29-869.000.
Heimer, Malcolm L., 4,712,179, Cl. 364-417.000.

Cornelison, Richard C.; and Retallick, William B., to W. R. Grace & Co. Process for making metal substrate catalytic converter cores. 4,711,009, Cl. 29-157.00R.

Corning Glass Works: *See*—
Bardhan, Pronob, 4,712,156, Cl. 361-321.000.
Gadkaree, Kishor P.; Haynes, William L.; and Lu, Kun-Er, 4,711,860, Cl. 501-9.000.

Corsentino, John A.: *See*—
Martyak, Nicholas M.; Corsentino, John A.; and McMullen, Warren H., 4,711,705, Cl. 204-34.000.

Cortronix, Inc.: *See*—
Schafer, Curtiss R., 4,711,243, Cl. 128-420.500.

Cosser, Harry F., to Schlumberger Electronics, Inc. Side arm fluid level gauge with spaced-apart sensors for density error compensation. 4,711,117, Cl. 73-1.00H.

Costantino, Paolo: *See*—
Porro, Massimo; and Costantino, Paolo, 4,711,779, Cl. 424-92.000.

Cottenceau, Remi: *See*—
Asper, Jean-Jacques; and Cottenceau, Remi, 4,710,984, Cl. 2-412.000.

Courtaulds PLC: *See*—
Urben, Peter G., 4,711,967, Cl. 558-243.000.

Cousins, David: *See*—
Li, Edward; Foss, Leonard; and Cousins, David, 4,711,227, Cl. 123-643.000.

Cowler, David J. W.; and Lewis, Peter R., to Fether, Kenneth B.; Miles, Richard; Rostron, Anthony; and Lewis, Peter R. Bracket and post assembly. 4,711,420, Cl. 248-243.000.

Cranford, William R.: *See*—
Deacon, George R.; and Cranford, William R., 4,711,752, Cl. 264-328.120.

Creative Sales & Mfg. Co., Inc.: *See*—
Ohs, Gary L.; and Byers, Timothy W., 4,711,538, Cl. 350-604.000.

Crema, Rolf, to Ernst Leitz Wetzlar GmbH. Film advance mechanism. 4,711,545, Cl. 354-213.000.

Crist, Owen K.: *See*—
Leibee, Donald L.; and Crist, Owen K., 4,711,312, Cl. 175-393.000.

Cronch, Robert D.; and Koudele, Larry J., to Magnetic Peripherals Inc. Circuit for phase locking a clock signal to a series of pulses. 4,712,076, Cl. 331-16.000.

Crosby, Samuel C.: *See*—
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,711,374, Cl. 222-129.100.

Cross, William E.; Hillestad, Jeanne E.; and Plyler, Robert G., to General Motors Corporation. Electrical connector. 4,711,509, Cl. 439-587.000.

Crowell, Jonathan C.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.

Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Cocito, Giuseppe, 4,711,587, Cl. 374-16.000.
Roba, Giacomo; and Modone, Eros, 4,711,652, Cl. 65-18.200.

CTS Corporation: *See*—
Kuo, Charles C. Y., 4,711,803, Cl. 428-209.000.

Cullo, Leonard A.; and Shiring, Francis J., III, to Aristech Chemical Corporation. Silica-titania hydrocarbon conversion catalyst. 4,711,869, Cl. 502-239.000.

Culver, Craig F., to Cheetah Control, Inc. Control mechanism for electronic apparatus. 4,712,101, Cl. 340-710.000.

Cummins Engine Co.: *See*—
Loukanis, Jesse J.; Mathews, Will W.; and Tune, Raymond L., 4,711,143, Cl. 76-108.00A.

Cummins Engine Company, Inc.: *See*—
Reichenbach, Dean H., 4,711,210, Cl. 123-321.000.

Cunningham, Frank W. Meniscal cutting device. 4,711,238, Cl. 128-303.140.

Cuno Incorporated: *See*—
Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., 4,711,793, Cl. 427-244.000.

Curtis Instruments, Inc.: *See*—
Finger, Eugene P., 4,712,195, Cl. 365-226.000.
Cusack, Michael D., to United Technologies Corporation. Method for densifying leadframe conductor spacing. 4,711,700, Cl. 156-651.000.
Czenczy, George: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
Dahlberg, Kurt, to Aktiebolaget Bofors. Method of combating different types of air targets. 4,712,181, Cl. 364-423.000.
Dahlin, Erik B., to Exac Corporation. Apparatus for mass flow rate and density measurement. 4,711,132, Cl. 73-861.380.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Fujita, Takeshi; and Kataoka, Hironori, 4,711,734, Cl. 252-52.00A.
Daimler-Benz Aktiengesellschaft: *See*—
Letsche, Ulrich; Rapp, Wolfgang, deceased; Haefner, Guenther; and Tonhaeuser, Wilhelm, 4,711,220, Cl. 123-502.000.
Dainichi-Nippon Cables, Ltd.: *See*—
Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.
Dainippon Ink and Chemicals, Inc.: *See*—
Ando, Hirohito; Takada, Zenji; and Shigeta, Yuko, 4,711,674, Cl. 106-289.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Murakami, Shigeo, 4,712,134, Cl. 358-213.130.
Tomohisa, Kunio; Cho, Masamichi; and Kurusu, Yasuo, 4,712,141, Cl. 358-280.000.
Dambkes, Georg: *See*—
Konkol, Werner; Bahrmann, Helmut; Dambkes, Georg; Gick, Wilhelm; Wiebus, Ernst; and Bach, Hanswilhelm, 4,711,648, Cl. 55-73.000.
Dana Corporation: *See*—
Campbell, Edward N., 4,711,439, Cl. 269-277.000.
Danieli & C. Officine Meccaniche SpA: *See*—
Duri, Antonino, 4,711,340, Cl. 198-451.000.
Daniels, James A., to Imperial Chemical Industries PLC. Polyketone. 4,711,945, Cl. 528-86.000.
Danjell, Barbara, to Danjell Creations, Inc. "Neon look" lighting. 4,711,044, Cl. 40-543.000.
Danjell Creations, Inc.: *See*—
Danjell, Barbara, 4,711,044, Cl. 40-543.000.
Daugherty, David A.: *See*—
Machado, Octavio J.; Daugherty, David A.; Andrews, Ronnie H.; and Efferding, Larry E., 4,711,758, Cl. 376-272.000.
Davidson, Richard R.: *See*—
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., 4,711,727, Cl. 210-727.000.
Davis, Loren G.; Schmitz, Steven R.; and Tauer, Dennis L., to Lee Data Corporation. Signal conversion circuit for interconnecting coaxial cable and a twisted pair. 4,712,210, Cl. 370-77.000.
Davis, Ronald G.; Denniston, Charles D.; and Van Skyock, Richard K., to General Motors Corporation. Spring and washer device. 4,711,265, Cl. 137-454.200.
Dawson, Darryl A.: *See*—
Fentress, Vernon A.; and Dawson, Darryl A., 4,711,517, Cl. 350-96.200.
Dayco Products, Inc.: *See*—
Long, Delmar D., 4,711,792, Cl. 427-176.000.
Dayton Reliable Tool & Mfg. Co.: *See*—
Bachmann, Henry C.; and Fraze, Ermal C., 4,711,611, Cl. 413-69.000.
Deacon, George R.; and Cranford, William R., to ITT Corporation. Method and apparatus for molding fiber optic connector ferrule. 4,711,752, Cl. 264-328.120.
Deason, James R.: *See*—
Mueller, Richard A.; Partis, Richard A.; and Deason, James R., 4,711,903, Cl. 514-381.000.
Degnan, Thomas F., Jr.: *See*—
Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., 4,711,710, Cl. 208-111.000.
DeLeon, Alberto: *See*—
Snider, Scott C.; and DeLeon, Alberto, 4,711,912, Cl. 521-125.000.
Delta International Machinery Corp.: *See*—
Rickmers, Clifford P.; Donovan, Robert D.; and Brickner, Louis C., Jr., 4,711,032, Cl. 30-372.000.
Demarchi, Jean-Louis: *See*—
Morell, Joseph; and Demarchi, Jean-Louis, 4,711,042, Cl. 36-50.000.
Demissy, Daniel: *See*—
Jeanjean, Robert; Demissy, Daniel; Saint-Jean, Guy; and Landry, Michel, 4,711,978, Cl. 200-148.00A.
Den Norske Stats Oljeselskap A.S.: *See*—
Ottestad, Nils T., 4,711,263, Cl. 137-102.000.
Den Hollander, Jan A.: *See*—
Luyten, Peter R.; and Den Hollander, Jan A., 4,712,066, Cl. 324-309.000.
Denick, John, Jr.; Peters, David; Talwar, Anil K.; and Liao, Wei C., to Warner-Lambert Company. Medicament adsorbates with complex magnesium aluminum silicate and their preparation. 4,711,774, Cl. 424-48.000.
Denk, Heimo: *See*—
Stubenberg, Johann; Denk, Heimo; and Zeiringer, Rudolf, 4,711,129, Cl. 73-708.000.
Denman, Owen S.: *See*—
Krage, William G.; Stephens, Barry D.; and Denman, Owen S., 4,711,481, Cl. 293-133.000.
Denniston, Charles D.: *See*—
Davis, Ronald G.; Denniston, Charles D.; and Van Skyock, Richard K., 4,711,265, Cl. 137-454.200.
Dentsply International Inc.: *See*—
Tateosian, Louis H.; and Wilson, W. Donald, 4,711,913, Cl. 522-14.000.
DeRobertis, Robert P.: *See*—
Glasser, George M.; DeRobertis, Robert P.; Smithwrick, John H.; and Kelly, William J., 4,711,979, Cl. 219-10.55D.
Dersch, Stefan: *See*—
Rietzscher, Rolf; Dersch, Stefan; and Riethmann, Max, 4,711,290, Cl. 164-66.100.
DeSanto, Joseph J. Method and apparatus for forming electrical harnesses. 4,711,025, Cl. 29-854.000.
Desousa, Egas J. Infinitely variable rotary drive transmission. 4,711,139, Cl. 74-837.000.
Despot, Janko: *See*—
Emrich, Helmut; Mathes, Josef; Ochs, Heinrich; and Despot, Janko, 4,711,173, Cl. 101-349.000.
Dessanti, Daniel J.: *See*—
Markbreiter, Stephen J.; and Dessanti, Daniel J., 4,711,093, Cl. 62-87.000.
DET-Drager-Energie-Technik GmbH & Co. KG: *See*—
Drager, Uwe; and Drager, Norbert, 4,711,402, Cl. 241-101.200.
Detrick, Jeffrey C. Compatibility/incompatibility forecasting device. 4,711,632, Cl. 434-106.000.
Dettelbach, Alfred; and Binder, Werner, to Reich Spezialmaschinen GmbH. Device for scoring workpieces. 4,711,147, Cl. 83-863.000.
Deutsche ITT Industries GmbH: *See*—
Gollinger, Wolfgang, 4,712,021, Cl. 307-355.000.
d'Humieres, Etienne; Bernet, Jean M.; and Imhoff, Claude, to Thomson CSF. Transient analysis system using a photonic sampler device. 4,712,001, Cl. 250-213.0VT.
Diamond Shamrock Chemicals Company: *See*—
Garvey, Christopher M.; Savoly, Arpad; and Weatherford, Thomas M., 4,711,731, Cl. 252-8.514.
Dickinson, Peter D.; and Luciano, Robert A., to International Game Technology (IGT). Amusement machine. 4,711,452, Cl. 273-143.00R.
Didier-Werke AG: *See*—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.
Diederich, David J.; and Paddock, John C., to USX Corporation. Tundish for mixing alloying elements with molten metal. 4,711,429, Cl. 266-44.000.
Diederich, Perry A., to PSI Star. Plasma reactor with voltage transformer. 4,711,767, Cl. 422-186.290.
Diehl, Francis L.: *See*—
Gosselink, Eugene P.; and Diehl, Francis L., 4,711,730, Cl. 252-8.750.
Diehl GmbH & Co.: *See*—
Argyrakis, Nikolaus, 4,711,178, Cl. 102-384.000.
Ringel, Konrad; and Rudolf, Karl, 4,711,181, Cl. 102-476.000.
Stessen, Lothar, 4,711,413, Cl. 244-3.160.
Wallermann, Heinrich, 4,711,412, Cl. 244-3.150.
Diesel Kiki Co., Ltd.: *See*—
Ito, Satoru, 4,711,205, Cl. 123-179.00L.
Oshizawa, Hidekazu; and Okamoto, Kenji, 4,711,211, Cl. 123-357.000.
Sakurai, Yoshihiko, 4,711,295, Cl. 165-22.000.
Digital Equipment Corporation: *See*—
Guglielmi, Paul M.; Melanson, Ronald J.; and Kotok, Alan, 4,712,190, Cl. 364-900.000.
Ditcher, Jack; and Westhoff, James A., to A-Lok Products, Inc. Gasket for use in manholes and including clamping band having cooperating projections and grooves for preventing relative axial movement of the opposing ends of the clamping band during installation and for facilitating expansion by an expansion jack. 4,711,455, Cl. 277-9.500.
Dittmar, Walter; Futterer, Eberhard; and Lohaus, Gerhard, to Hoechst Aktiengesellschaft. Cosmetic compositions. 4,711,775, Cl. 424-70.000.
DiVincenzo, Maureen. Needlecraft with metallic substrate. 4,711,800, Cl. 428-131.000.
Dixon Automatic Tool, Inc.: *See*—
Dixon, Paul A., 4,711,343, Cl. 198-465.200.
Dixon, Dale D.: *See*—
Burgoyne, William F., Jr.; and Dixon, Dale D., 4,711,737, Cl. 252-77.000.
Dixon, Paul A., to Dixon Automatic Tool, Inc. Power-and-free conveyor apparatus for handling pallet-supported workpieces. 4,711,343, Cl. 198-465.200.
DNA Plant Technology Corporation: *See*—
Orr, Avigdor; and Spingler, John O., 4,711,789, Cl. 426-326.000.
Doddington, George R.: *See*—
Rajasekaran, Periagaram K.; Doddington, George R.; and Schalk, Thomas B., 4,712,242, Cl. 381-42.000.
Doe, Lester A., Jr., to R. T. Vanderbilt Company, Inc. Surface coating compositions containing substituted 1,3,4-thiadiazoles. 4,711,915, Cl. 523-122.000.
Doggrell, Leslie A.: *See*—
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.
Doherty, James B.: *See*—
Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., 4,711,886, Cl. 514-195.000.

Doi, Masahiro: *See*—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.

Dolby, Ray M. Disc reproducing system for compensating mechanical imperfections. 4,712,208, Cl. 369-128.000.

Dombroski, Robert M.; and Kayser, John P., to Madison-Kipp Corporation. Wheel flange and rail lubricator apparatus. 4,711,320, Cl. 184-3.200.

Dombrowski, Michael A.; and Eikeland, Nancy M., to Dombrowski, Michael A. Instructional device for tennis players. 4,711,633, Cl. 434-247.000.

Dombrowski, Theodor: *See*—
Lung, Dieter; Kluft, Werner; Fabry, Jochen; Wittkopp, Helmut; Dombrowski, Theodor; and Klosterhalfen, Hartwig, 4,711,146, Cl. 82-1.00C.

Dominguez, Ben, to Formers of Houston, Inc. Packaging machines and wear strips therefor. 4,711,068, Cl. 53-551.000.

Donoian, Gary S.: *See*—
Mehta, Pradip S.; Valsamis, Lefteris N.; and Donoian, Gary S., 4,711,581, Cl. 366-99.000.

Donovan, Robert D.: *See*—
Rickmers, Clifford P.; Donovan, Robert D.; and Brickner, Louis C., Jr., 4,711,032, Cl. 30-372.000.

Dorn, Conrad P.: *See*—
Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., 4,711,886, Cl. 514-195.000.

Dorow, Rainer: *See*—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.

Dosaka, Katsumi: *See*—
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.

Douglas, Monte A., to Texas Instruments Incorporated. Silicon oxide thin film etching process. 4,711,698, Cl. 156-643.000.

Dow Corning Corporation: *See*—
Lee, Chi-long; and Maxson, Myron T., 4,711,928, Cl. 524-860.000.

Dowell, Robert I.: *See*—
Briggs, Malcolm T.; Dowell, Robert I.; and Thornber, Craig W., 4,711,887, Cl. 514-247.000.

Drader, Clarence H. Process for welding thermoplastic by injection. 4,711,746, Cl. 264-36.000.

Drager, Norbert: *See*—
Drager, Uwe; and Drager, Norbert, 4,711,402, Cl. 241-101.200.

Drager, Uwe; and Drager, Norbert, to DET-Drager-Energie-Technik GmbH & Co. KG. Apparatus for reducing the size of and/or for mixing solid, pasty and/or liquid material. 4,711,402, Cl. 241-101.200.

Drane, John H., to Duracell Inc. Lamp. 4,711,107, Cl. 70-233.000.

Drexler, Jerome; and Haddock, Richard, to Drexler Technology Corporation. Protective envelope for optical data card. 4,711,347, Cl. 206-38.000.

Drexler, Jerome, to Drexler Technology Corporation. Redundant optical recording of information in different formats. 4,711,996, Cl. 235-468.000.

Drexler Technology Corporation: *See*—
Drexler, Jerome; and Haddock, Richard, 4,711,347, Cl. 206-38.000.
Drexler, Jerome, 4,711,996, Cl. 235-468.000.

Drost, James L.: *See*—
Gordin, Myron K.; and Drost, James L., 4,712,167, Cl. 362-233.000.

Du Pont Canada Inc.: *See*—
Zboril, Vaclav G., 4,711,923, Cl. 524-323.000.

DuBarry Furniture of Canada Limited: *See*—
Magder, Max, 4,711,495, Cl. 297-440.000.

Dubner, Robert; Dubner, Russel S.; and Dubner, Todd A., to Rebound Systems, Inc. Protective headgear for wrestler. 4,710,985, Cl. 2-425.000.

Dubner, Russel S.: *See*—
Dubner, Robert; Dubner, Russel S.; and Dubner, Todd A., 4,710,985, Cl. 2-425.000.

Dubner, Todd A.: *See*—
Dubner, Robert; Dubner, Russel S.; and Dubner, Todd A., 4,710,985, Cl. 2-425.000.

Dubroeucq, Marie-Christine; Le Fur, Gerard R.; and Renault, Christian L. A., to Rhone-Poulenc Sante. Pharmaceutical compositions containing azanaphthalene-carboxamide derivatives, azanaphthalene-carboxamide derivatives and process for their use. 4,711,890, Cl. 514-311.000.

Duc, Jean: *See*—
Jamonet, Bernard; Rigouard, Alain; Bouchez, Jean-Pierre; and Duc, Jean, 4,711,721, Cl. 210-607.000.

Duchin, Daniel, to Monarch Marking Systems, Inc. Tab dispensing and attaching apparatus. 4,711,369, Cl. 221-213.000.

Dufour, Michel, to Thomson-CSF. Process for photolithographing a thick layer of paste deposited on a substrate. 4,711,835, Cl. 430-314.000.

Duke University Patents Foundation: *See*—
Goldwasser, Benad; and Carson, Culley, 4,711,240, Cl. 128-319.000.

Dull, Carl: *See*—
Scott, William A.; and Dull, Carl, 4,711,744, Cl. 261-64.400.

Duncan, William; and Barlow, Arthur J., to University of Glasgow, The University Court of the. Thermoelectric Si-Ge alloy composition. 4,711,971, Cl. 136-211.000.

Dunden, Walter J., to Chef Francisco, Inc. Container for freezing and storage of foodstuffs. 4,711,356, Cl. 206-503.000.

Dunn, Michael J., to Boeing Company, The. Projectile with integrated propulsion system. 4,711,414, Cl. 244-3.220.

Dupasquier, Guy: *See*—
Massa, Andre; and Dupasquier, Guy, 4,711,070, Cl. 53-573.000.

Du Pont de Nemours, E. I., and Company: *See*—
Burns, John T., 4,711,812, Cl. 428-401.000.
Christini, Theodore P., 4,711,827, Cl. 428-690.000.
Johnson, Van B.; and Nicosia, Salvatore J., 4,712,228, Cl. 378-185.000.
Randa, Stuart K., 4,711,811, Cl. 428-383.000.
Stamegna, Andrew P.; and Strolle, Clifford H., 4,711,929, Cl. 525-131.000.
Tannenbaum, Harvey P., 4,711,802, Cl. 428-207.000.
Webster, Owen W., 4,711,942, Cl. 526-185.000.

Duracell Inc.: *See*—
Drane, John H., 4,711,107, Cl. 70-233.000.

Durbin, James L.: *See*—
Andres, Kenneth E.; Weingardt, Gary; and Durbin, James L., 4,711,390, Cl. 229-41.00R.

Duri, Antonino, to Danieli & C. Officine Meccaniche SpA. Device to discharge rolled products onto a cooling plate, closure of the device taking place by positive actuation. 4,711,340, Cl. 198-451.000.

Duriron Company, Inc., The: *See*—
Medvid, Richard J., 4,711,264, Cl. 137-241.000.

Duro Med Industries, Inc.: *See*—
Whitehead, Edward J., 4,711,445, Cl. 272-67.000.

Durr, Charles A.: *See*—
Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A., 4,711,651, Cl. 62-34.000.

Durr, Walter. Dental handpiece assembly. 4,711,630, Cl. 433-82.000.

Duvenkamp, Manfred, to General Motors Corporation. Foldable headrest for vehicle rear seat. 4,711,494, Cl. 297-403.000.

Dvorak, Robert F., to Square D Company. System for detection of ground faults in circuit breakers. 4,712,151, Cl. 361-47.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Heimsoth, Harald; and Herbst, Thomas, 4,711,604, Cl. 405-260.000.

E. Allman & Company Limited: *See*—
Ganderton, Alfred D.; and Brazier, William A., 4,711,398, Cl. 239-167.000.

E.D.S. Company: *See*—
Schmidt, Edward D., 4,711,786, Cl. 426-19.000.

E. R. Squibb & Sons, Inc.: *See*—
Karanewsky, Donald S., 4,711,884, Cl. 514-226.000.
Varma, Ravi K.; and Gordon, Eric M., 4,711,900, Cl. 514-351.000.

E. W. Buschman Company, The: *See*—
Yu, Thomas C.; Vogt, Robert K.; and Wilkins, John J., 4,711,341, Cl. 198-372.000.

Early, Paul D., Jr.: *See*—
Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., 4,711,255, Cl. 131-330.000.

East Moline Metal Products Company: *See*—
Boldt, Robert R., 4,712,054, Cl. 318-758.000.

Eastlund, Bernard J.; and Ramo, Simon, to APTI, Inc. Method and apparatus for creating an artificial electron cyclotron heating region of plasma. 4,712,155, Cl. 361-231.000.

Eastman Kodak Company: *See*—
Borsenberger, Paul M., 4,711,831, Cl. 430-95.000.
Gruenbaum, William T.; Harmon, Julie P.; and Roberts, Luther C., 4,711,832, Cl. 430-106.000.
Marcus, Michael A.; and Benson, John E., 4,711,808, Cl. 428-336.000.

Eaton Corporation: *See*—
Speranza, Donald, 4,711,141, Cl. 74-866.000.

Eckardt, Dieter; and Hettich, Gerhard, to Robert Bosch GmbH. Magnetoresistive sensor for detecting position or speed of a ferromagnetic body. 4,712,064, Cl. 324-208.000.

Eckhardt, Dennis C., to General Motors Corporation. Check valve in auxiliary vacuum system. 4,711,224, Cl. 123-572.000.

Eckhart, Horst: *See*—
Holderle, Hans; Wolf, Jurgen; Eckhart, Horst; and Vonderau, Werner, 4,711,225, Cl. 123-590.000.

Ecklund, Lawrence M., to Motorola, Inc. Broadcast signal detected indication system. 4,712,241, Cl. 381-15.000.

Ecolab Inc.: *See*—
Copeland, James L., 4,711,738, Cl. 252-95.000.

Edenborough, John S.: *See*—
Neuhalfen, Michael A.; Ridoux, Frank E.; and Edenborough, John S., 4,711,226, Cl. 123-609.000.

Edwards, Richard L.: *See*—
Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., 4,711,035, Cl. 33-200.000.

Efferding, Larry E.: *See*—
Machado, Octavio J.; Daugherty, David A.; Andrews, Ronnie H.; and Efferding, Larry E., 4,711,758, Cl. 376-272.000.

Ehrnstrom, Hans, to Nitro Nobel AB. Process for the preparation of a water-in-oil emulsion explosive and a fuel phase for use in such process. 4,711,678, Cl. 149-2.000.

Eich, Helmut. Radiation lamp unit. 4,712,014, Cl. 250-494.100.

Eikeland, Nancy M.: *See*—
Dombrowski, Michael A.; and Eikeland, Nancy M., 4,711,633, Cl. 434-247.000.

Elsenbaumer, Ronald L.: *See*—
Jen, Kwan-Yue A.; and Elsenbaumer, Ronald L., 4,711,742, Cl. 252-500.000.

Eltek S.p.A.: *See*—
Fornasari, Paolo, 4,711,270, Cl. 137-625.500.

Emery, Keith A.: *See—*
Osterwald, Carl R.; and Emery, Keith A., 4,712,063, Cl. 324-158.00D.

Emond, George T.: *See—*
Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., 4,711,793, Cl. 427-244.000.

Emrich, Helmut; Mathes, Josef; Ochs, Heinrich; and Despot, Janko, to M.A.N.- Roland Druckmaschinen Aktiengesellschaft. Changing drive for the distributing rollers of at least one inking unit of a printing unit of an offset rotary press. 4,711,173, Cl. 101-349.000.

Energy Absorption Systems, Inc.: *See—*
Krage, William G.; Stephens, Barry D.; and Denman, Owen S., 4,711,481, Cl. 293-133.000.

Engels, Joachim: *See—*
Konig, Wolfgang; Engels, Joachim; Uhlmann, Eugen; and Wetekam, Waldemar, 4,711,847, Cl. 435-70.000.

Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, to Nippon Shinyaku Co., Ltd. 4-quinolone derivatives having anti-inflammatory, anti-allergic, antitussive, expectorant and antithrombotic activity. 4,711,898, Cl. 514-312.000.

Entech, Inc.: *See—*
O'Neill, Mark J., 4,711,972, Cl. 136-246.000.

Environmental Research Institute of Michigan: *See—*
Upatnieks, Juris, 4,711,512, Cl. 350-3.700.

EPIS S.A.: *See—*
Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, 4,711,896, Cl. 514-570.000.

Eriksson, Mats, to Flakt, AB. Method of ventilating rooms. 4,711,162, Cl. 98-38.300.

Eriksson, Ulf: *See—*
Sundberg, Sten; Risberg, Stig; and Eriksson, Ulf, 4,711,179, Cl. 102-426.000.

Eriss, Lawrence: *See—*
Stormont, Richard W.; and Eriss, Lawrence, 4,711,695, Cl. 156-608.000.

Erker, James W.; Scotese, Michael J.; and Stotts, Jay B., to Caterpillar Industrial Inc. Lift mast mounting arrangement and method for removal. 4,711,614, Cl. 414-641.000.

Ernst, Alfons, to Johannes Heidenhain GmbH. Multistage angle encoder with an improved allocation of coarse code information to fine code information. 4,712,088, Cl. 340-347.00P.

Ernst Leitz Wetzlar GmbH: *See—*
Crema, Rolf, 4,711,545, Cl. 354-213.000.

Esjot-Werke Schiermeister & Junker GmbH & Co. KG: *See—*
Hoffmann, Joachim, 4,711,331, Cl. 192-46.000.

Esser, Gunther: *See—*
Radisch, Helmer; and Esser, Gunther, 4,711,805, Cl. 428-323.000.

Essex Group, Inc.: *See—*
Lahiff, John E., 4,711,397, Cl. 239-125.000.

Etablissements Morel - Ateliers Electromecaniques de Favieres: *See—*
Morel, Jacques; and Morel, Didier, 4,711,975, Cl. 174-92.000.

Ethyl Corporation: *See—*
Nelson, Gunner E., 4,711,965, Cl. 556-478.000.
Nelson, Gunner E., 4,711,966, Cl. 556-478.000.

Etschenberg, Eugen: *See—*
Welter, Andre ; Leyck, Sigurd; and Etschenberg, Eugen, 4,711,961, Cl. 548-121.000.

Evans, Bruce M., to Minnesota Mining and Manufacturing Company. Apparatus for electronic scanning and microfilming of documents. 4,711,566, Cl. 355-41.000.

Exac Corporation: *See—*
Dahlin, Erik B., 4,711,132, Cl. 73-861.380.

Extance, Philip: *See—*
Pitt, Gillies D.; Extance, Philip; and Jones, Roger E., 4,712,065, Cl. 324-244.000.

Exxon Chemical Patents Inc.: *See—*
Kuntz, Irving, 4,711,866, Cl. 502-152.000.
Speca, Anthony N., 4,711,865, Cl. 502-116.000.

Exxon Research and Engineering Company: *See—*
Chen, Te H.; Cicchino, Dominic; and Shadbolt, Peter J., 4,711,186, Cl. 110-336.000.
Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, 4,711,672, Cl. 106-281.00R.
Oswald, Alexis A.; and Bhatia, Ram N., 4,711,968, Cl. 568-454.000.
Wachs, Israel E.; and Yang, Darchun B., 4,711,871, Cl. 502-325.000.

Fabry, Jochen: *See—*
Lung, Dieter; Kluft, Werner; Fabry, Jochen; Wittkopp, Helmut; Dombrowski, Theodor; and Klosterhalfen, Hartwig, 4,711,146, Cl. 82-1.00C.

Fahim, Mostafa S. Composition and process for promoting epithelial regeneration. 4,711,780, Cl. 424-145.000.

Fail, Jean-Pierre, to Institute Francais du Petrole. Process for optimizing the frequency spectrum of pulses emitted by an emission device comprising several seismic implosion forces. 4,712,198, Cl. 367-23.000.

Fairchild Camera & Instrument Corp.: *See—*
Kuo, James R., 4,712,233, Cl. 379-386.000.

Falk, Carl H., to Valmet-KMW Aktiebolag. Apparatus for cutting a paper web. 4,711,404, Cl. 242-56.00R.

Falotico, Robert: *See—*
Bandurco, Victor T.; Schwender, Charles F.; Falotico, Robert; and Tobia, Alfonso J., 4,711,883, Cl. 514-253.000.

Falwell, Bobby R.; and Wooley, Orval H. Waterbed rail cap. 4,710,992, Cl. 5-508.000.

Fann, Yaw-Shin; and Wu, Rong-Faa, to Tong Lung Metal Industry Co., Ltd. Duplex latch bolt mechanism. 4,711,477, Cl. 292-169.140.

Fanuc Ltd.: *See—*
Aso, Toshiyuki; and Ishibashi, Tamotu, 4,711,981, Cl. 219-69.00W.

Faria, Lawrence E.; and Christopher, Earl H., to Raytheon Company. Seal-less cryogenic expander. 4,711,650, Cl. 62-6.000.

Farrel Corporation: *See—*
Mehta, Pradip S.; Valsamis, Lefteris N.; and Donoian, Gary S., 4,711,581, Cl. 366-99.000.

Fasco Industires, Inc.: *See—*
Lakin, Bryan L.; and Wharton McDaniel, William P., 4,712,030, Cl. 310-89.000.

Fasco Industries, Inc.: *See—*
Lakin, Bryan L., 4,711,590, Cl. 384-206.000.

Fathi, Saul S., to Ultima Electronics Ltd. Adapter for switching from primary to standby device upon failure of primary device. 4,712,051, Cl. 318-564.000.

Featherston, William L.: *See—*
Wiens, Terry G.; and Featherston, William L., 4,711,260, Cl. 135-16.000.

Fecik, Michael T.: *See—*
Frank, Robert G.; Claassen, George R.; Waterloo, Thomas L.; Schultz, Stephen J.; and Fecik, Michael T., 4,711,653, Cl. 65-106.000.

Feilchenfeld, Michal M.; and Connors, Grant R., to Westinghouse Electric Corp. Position indicating device. 4,711,757, Cl. 376-258.000.

Feinberg, Richard R., to Ciba Corning Diagnostics Corp. Derivatives of 3,5,3-triiodothyronine. 4,711,855, Cl. 436-500.000.

Feinstein, Jonathan J., to Union Carbide Corporation. Side-injected metal refining vessel and method. 4,711,430, Cl. 266-47.000.

Felder, Willie L. Bicycle rack with safety light. 4,711,381, Cl. 224-39.000.

Fentress, Vernon A.; and Dawson, Darryl A. Method and apparatus for installing fiber optic cables. 4,711,517, Cl. 350-96.200.

Ferdelman, Donald C.: *See—*
Knable, Joseph J.; Ferdelman, Donald C.; and Bojanowski, Gerald M., 4,711,463, Cl. 280-668.000.

Ferrari, Lorenzo, to Kinglor-Ltd. Process for the automatic forming of continuous metal tube filled with powdered materials, its direct introduction in to liquid metal, and related equipment. 4,711,663, Cl. 75-53.000.

Ferreira, Lawrence, to Olin Hunt Specialty Products, Inc. Development of positive-working photoresist compositions. 4,711,836, Cl. 430-326.000.

Feth, John R., to Litton Systems, Inc. Polarizing optical fiber with absorbing jacket. 4,711,525, Cl. 350-96.330.

Fether, Kenneth B.: *See—*
Cowler, David J. W.; and Lewis, Peter R., 4,711,420, Cl. 248-243.000.

FEV Forschungsgesselschaft fur Energie-Technik und Verbrennungsmotoren mbH: *See—*
Gurich, Gunter L., 4,712,036, Cl. 310-333.000.

FGL Projects Limited: *See—*
Gannon, Raymond, 4,712,249, Cl. 383-43.000.

Fiberoptic Sensor Technologies, Inc.: *See—*
Alderson, Richard, 4,711,246, Cl. 128-667.000.

Field, Charles A.: *See—*
Griffin, Dennis; and Field, Charles A., 4,711,151, Cl. 89-1.805.

Finegold, Aaron N.; and Taylor, Maurice E., to Finegold, Aaron N. Implantable prosthesis system. 4,711,231, Cl. 128-79.000.

Finger, Eugene P., to Curtis Instruments, Inc. Solid-state cumulative operations measurement system. 4,712,195, Cl. 365-226.000.

Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., to Merck & Co., Inc. β-lactam derivatives as anti-inflammatory and antidegenerative agents. 4,711,886, Cl. 514-195.000.

Finnell, Dennis C.: *See—*
Antone, Wayne L., II; and Finnell, Dennis C., 4,711,634, Cl. 439-136.000.

Fiore, Joseph V.: *See—*
Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., 4,711,793, Cl. 427-244.000.

Firetek Corporation: *See—*
Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, 4,712,096, Cl. 340-590.000.

Firmenich SA: *See—*
Schulte-Elte, Karl-Heinrich; Ohloff, Gunther; Muller, Bernard L.; and Giersch, Wolfgang K., 4,711,875, Cl. 512-1.000.

Fischer, Artur; and Kramer, Wolfgang, to Fischer, Artur. Bone fastener and method of installing same. 4,711,232, Cl. 128-92.0YF.

Fischer, Dennis J.: *See—*
Angehrn, Jorg A.; and Fischer, Dennis J., 4,711,122, Cl. 73-151.000.

Fisher, Maurice J.: *See—*
Napier, Brian A.; and Fisher, Maurice J., 4,711,039, Cl. 34-57.00A.

Fishman, Henry. Allergy testing method and apparatus. 4,711,247, Cl. 128-743.000.

Flakt, AB: *See—*
Eriksson, Mats, 4,711,162, Cl. 98-38.300.

Fleisher, Nathaniel; and Spector, George. Cigar holder. 4,711,254, Cl. 131-189.000.

Flygt AB: *See—*
Nyman, Lars-Erik, 4,711,199, Cl. 119-3.000.

FMC Corporation: *See*—
Chryssomallis, George; and Griffing, Robert S., 4,711,154, Cl. 89-7.000.
Green, Joseph, 4,711,931, Cl. 525-394.000.
Wafer, Don B.; and Barrington, Claud C., 4,711,262, Cl. 137-14.000.
Focke & Co.: *See*—
Focke, Heinz; and Balmer, Oskar, 4,711,349, Cl. 206-260.000.
Focke & Co. (GmbH): *See*—
Focke, Heinz; Langer, Horst; and Bretthauer, Hans-Jurgen, 4,711,065, Cl. 53-170.000.
Focke, Heinz; Langer, Horst; and Bretthauer, Hans-Jurgen, to Focke & Co. (GmbH). Apparatus for producing packs, especially cigarette cartons. 4,711,065, Cl. 53-170.000.
Focke, Heinz; and Balmer, Oskar, to Focke & Co. Pouch pack for tobacco as well as a process and apparatus for making this. 4,711,349, Cl. 206-260.000.
Fomby, Kenneth A. Container and closure assembly with folding sealing ribs. 4,711,365, Cl. 220-288.000.
Forbes, Franklin L.; and Harms, Harold B., to General Electric Company. Salient pole core and salient pole electronically commutated motor. 4,712,035, Cl. 310-269.000.
Ford, Victoria L.; and Morgan, Bryan J., to Pegasus Airwave Limited. Air supply and control apparatus for inflatable mattress. 4,711,275, Cl. 141-95.000.
Formers of Houston, Inc.: *See*—
Dominguez, Ben, 4,711,068, Cl. 53-551.000.
Fornasari, Paolo, to Eltek S.p.A. Thermoelectric valve for channeling refrigerant gases into different tubes in refrigeration devices. 4,711,270, Cl. 137-625.500.
Fortin, Jean-Louis. Tipper trailer. 4,711,499, Cl. 298-5.000.
Fortunko, Chris M., to Aerojet-General Corporation. Apparatus for transmititng data to a projectile positioned within a gun tube. 4,711,152, Cl. 89-6.500.
Foss, Leonard: *See*—
Li, Edward; Foss, Leonard; and Cousins, David, 4,711,227, Cl. 123-643.000.
Foster, Joe: *See*—
Baugh, John L.; and Foster, Joe, 4,711,326, Cl. 188-67.000.
Foster, Joseph C., Jr.; and Bilek, Andrew G., to United States of America, Air Force. Auxiliary booster. 4,711,177, Cl. 102-204.000.
Fowler, John T., to Laitram Corporation, The. Streamer interface adapter cable mounted leveler. 4,711,194, Cl. 114-245.000.
Fox, Lester A.; and Zielinski, Paul E., to Surgimach Corporation, The. Method and apparatus for packaging medical gauze sponges. 4,711,066, Cl. 53-436.000.
Franchina, Thomas F.; Gudmundson, Gunnar G.; and Reuss, John R., to 2610 PGA Partnership. Add-on attachment for high-speed photographic printer. 4,711,565, Cl. 355-39.000.
Frank, Robert G.; Claassen, George R.; Waterloo, Thomas L.; Schultz, Stephen J.; and Fecik, Michael T., to PPG Industries, Inc. Innovative press bending of thermoplastic sheets. 4,711,653, Cl. 65-106.000.
Frappier, Edward P.: *See*—
Hull, Ezekiel H.; and Frappier, Edward P., 4,711,922, Cl. 524-310.000.
Fraze, Ermal C.: *See*—
Bachmann, Henry C.; and Fraze, Ermal C., 4,711,611, Cl. 413-69.000.
Frazer-Nash Ltd.: *See*—
Griffin, Dennis; and Field, Charles A., 4,711,151, Cl. 89-1.805.
Frazier, Stanley J.; and Sorenson, Blaine. Portable and collapsible stair. 4,711,282, Cl. 182-106.000.
Fredericks, Kenneth J.; Guerriero, Thomas W.; Miracle, Gerald H.; and Wiegand, Michael R., to International Business Machines Corp. Serial channel interface with method and apparatus for handling data streaming and data interlocked modes of data transfer. 4,712,176, Cl. 364-200.000.
Freeman, Clarence S.; and Freeman, Katherine M. Method for wire insulation. 4,711,022, Cl. 29-825.000.
Freeman, Katherine M.: *See*—
Freeman, Clarence S.; and Freeman, Katherine M., 4,711,022, Cl. 29-825.000.
Freier, Edward, Jr.; and Schaefer, Daniel W., to Simplicity Manufacturing, Inc. Clipping propulsion means for tractor mower. 4,711,073, Cl. 56-13.300.
Freimuth, Martin: *See*—
Knauer, Joachim F.; and Freimuth, Martin, 4,711,625, Cl. 425-549.000.
Frentzel-Beyme, Johannes; and Stenmans, Heinz, to Palitex Project Company GmbH. Thread brake mechanism for a spindle assembly of a thread processing machine. 4,711,081, Cl. 57-279.000.
Fresenius AG: *See*—
Polaschegg, Hans-Dietrich, 4,711,715, Cl. 210-103.000.
Fresquez, Chris J.: *See*—
Fresquez, Meredith L.; Fresquez, Chris J.; and Porter, Daniel A., 4,711,585, Cl. 368-109.000.
Fresquez, Meredith L.; Fresquez, Chris J.; and Porter, Daniel A. Cueing aid for prenatal breathing control. 4,711,585, Cl. 368-109.000.
Fretwell, Percy, to Henderson Doors Limited. Vehicle lift devices. 4,711,613, Cl. 414-550.000.
Frezza, William; Simons, Robert; and Westerfer, Richard, to General Instrument Corporation. Security arrangement for downloadable cable television converters. 4,712,239, Cl. 380-20.000.
Friedrich, Marju L.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
Fritschi, Edgar: *See*—
Satzinger, Gerhard; Hartenstein, Johannes; Mannhardt, Karl; Kleinschroth, Jurgen; Osswald, Hartmut; Weinheimer, Gunter; and Fritschi, Edgar, 4,711,901, Cl. 514-300.000.
Frohberger, Paul-Ernst: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,711,657, Cl. 71-92.000.
Fromberg, John P., to Positive Connections, Inc. Three-axis trailer hitch having improved rotatable coupling between vehicle and trailer. 4,711,461, Cl. 280-494.000.
Fromme, Georg, to Robert Bosch GmbH. Method of determining rotary speed of a rotating element in a braking effort regulation system. 4,712,186, Cl. 364-565.000.
Fuji Electric Company, Ltd.: *See*—
Hongo, Yasuo, 4,712,248, Cl. 382-22.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Kitade, Nobumitsu, 4,711,318, Cl. 180-247.000.
Okamura, Minoru, 4,711,333, Cl. 192-0.076.
Sakakiyama, Ryuzo, 4,711,317, Cl. 180-197.000.
Fuji Photo Film Co., Ltd.: *See*—
Hanai, Kazuko; and Yamada, Yasuyuki, 4,711,819, Cl. 428-425.900.
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.
Inagaki, Yoshio; and Shishido, Tadao, 4,711,963, Cl. 548-365.000.
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.
Ohgoda, Makoto; and Tamura, Kaoru, 4,712,009, Cl. 250-327.200.
Fujimoto, Sachi M. Nestable mini-greenhouse apparatus. 4,711,051, Cl. 47-17.000.
Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, to Sanyo Electric Co., Ltd. Developing apparatus. 4,711,551, Cl. 355-3.0DD.
Fujioka, Tadashi: *See*—
Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, 4,711,550, Cl. 355-3.0SH.
Fujishima, Daishiro; and Fujishima, Shinichiro. Disoxidant composition. 4,711,741, Cl. 252-188.280.
Fujishima, Kazuyasu: *See*—
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.
Fujishima, Shinichiro: *See*—
Fujishima, Daishiro; and Fujishima, Shinichiro, 4,711,741, Cl. 252-188.280.
Fujita, Takeshi; and Kataoka, Hironori, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Oily phase dispersions employing an oil-miscible dispersing agent. 4,711,734, Cl. 252-52.00A.
Fujita, Yukio: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
Fujitsu Limited: *See*—
Kikuchi, Shunichi; Matsunaga, Haruyuki; Katsumi, Hideo; and Katsuyama, Koji, 4,712,158, Cl. 361-385.000.
Yokoyama, Naoki, 4,712,121, Cl. 357-4.000.
Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, to Yamatake Honeywell. Multicontrol process control system. 4,712,173, Cl. 364-138.000.
Fujiwara, Michio: *See*—
Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, 4,711,091, Cl. 60-517.000.
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, to Tokyo Electric Co., Ltd. Sheet supply device. 4,711,443, Cl. 271-126.000.
Fujiyama, Kunio, to Takara Company. Barber and beauty parlor chair. 4,711,486, Cl. 297-71.000.
Fujiyama, Seiki; and Lee, Myonghi, to Sillony Company Limited. Editing system of educational program for a computer assisted instruction system. 4,712,180, Cl. 364-419.000.
Fukao, Masami: *See*—
Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, 4,711,873, Cl. 502-344.000.
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, to Ishida Scales Mfg. Co., Ltd. Composite-motion drive unit and combinatorial weighing apparatus employing the same. 4,711,345, Cl. 198-572.000.
Fukushima, Kazumasa: *See*—
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, 4,712,243, Cl. 381-43.000.
Fuminao, Tanitomi, to Kaisei Kogyo Corporation. Tree pruning machine. 4,711,278, Cl. 144-2.00Z.
Funabashi, Motohisa: *See*—
Wakamori, Fumio; Ohata, Hideo; Miyaoka, Shinichiro; and Funabashi, Motohisa, 4,712,182, Cl. 364-507.000.
Furuhashi, Hiroyuki: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.
Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,940, Cl. 526-124.000.
Futterer, Eberhard: *See*—
Dittmar, Walter; Futterer, Eberhard; and Lohaus, Gerhard, 4,711,775, Cl. 424-70.000.

G. D. Searle & Co.: *See*—
Mueller, Richard A.; Partis, Richard A.; and Deason, James R., 4,711,903, Cl. 514-381.000.

G.D. Societa Per Azioni: *See*—
Mattei, Riccardo, 4,711,336, Cl. 198-347.000.

Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating closure. 4,711,372, Cl. 222-23.000.

Gadkaree, Kishor P.; Haynes, William L.; and Lu, Kun-Er, to Corning Glass Works. Modified cordierite glass ceramic composite. 4,711,860, Cl. 501-9.000.

Galati, Gaspare; and Orsini, Mario, to Selenia Industrie Elettroniche Associate S.p.A. Device for the identification of undesirable echoes in radar systems. 4,712,109, Cl. 342-159.000.

Galerneau, Jacques: *See*—
Brison, Bernard; Galerneau, Jacques; Gontier, Alex; and Petrozzi, Gerard, 4,710,980, Cl. 2-50.000.

Galgana, Thomas C. Lobster pot. 4,711,050, Cl. 43-102.000.

Ganderton, Alfred D.; and Brazier, William A., to E. Allman & Company Limited. Spraying equipment. 4,711,398, Cl. 239-167.000.

Gannon, Raymond, to FGL Projects Limited. Valves. 4,712,249, Cl. 383-43.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Haghiri-Tehrani, Yahya, 4,711,690, Cl. 156-309.600.

Garrett Corporation, The: *See*—
Mendelson, Ralph A., 4,711,677, Cl. 148-325.000.

Garro, Jose P. Combination lock. 4,711,108, Cl. 70-312.000.

Garvey, Christopher M.; Savoly, Arpad; and Weatherford, Thomas M., to Diamond Shamrock Chemicals Company. Drilling fluid dispersant. 4,711,731, Cl. 252-8.514.

Gas Research Institute: *See*—
Meyer, Thomas J.; O'Toole, Terrence R.; Margerum, Lawrence D.; Westmoreland, T. David; Vining, William J.; Murray, Royce W.; and Sullivan, B. Patrick, 4,711,708, Cl. 204-280.000.

Gast, Daniel A. Game skinning device. 4,710,998, Cl. 17-21.000.

Gathmann, Egon, to Barmag Aktiengesellschaft. Process and apparatus for degassing liquids, especially polymer melts and solutions. 4,711,647, Cl. 55-52.000.

Gaudilliere, Bernard; and Rousseau, Jean, to Synthelabo. 2-(4-benzoyl-1-piperidyl)-1-phenylalkanol derivatives. 4,711,899, Cl. 514-330.000.

Gaul, James M.: *See*—
Statton, Gary L.; and Gaul, James M., 4,711,910, Cl. 521-107.000.

Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., to Coca-Cola Company, The. Low-cost post-mix beverage dispenser and syrup supply system therefor. 4,711,374, Cl. 222-129.100.

Geary, Frederick J., to Robertshaw Controls Company. Hot surface ignition system for a gas furnace and method of making the same. 4,711,628, Cl. 431-31.000.

Gebruder Buhler AG: *See*—
Schaffner, Hanspeter, 4,711,622, Cl. 425-331.000.

Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck": *See*—
Reuter, Alfred, 4,711,279, Cl. 144-39.000.

Gegel, Harold L.: *See*—
Oberly, Charles E.; Gegel, Harold L.; and Ho, James C., 4,711,825, Cl. 428-614.000.

Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, to Bayer Aktiengesellschaft. 5-perfluoroacylamino-4-nitro-1-arylpyrazole salts, plant growth regulating and herbicidal composition containing them, and plant growth regulating and herbicidal method of using them. 4,711,658, Cl. 71-92.000.

Gelfand, David H.; and Lawyer, Frances C., to Cetus Corporation. Portable temperature-sensitive control cassette. 4,711,845, Cl. 435-68.000.

Gellman, Aaron J.: *See*—
Boldridge, Austin, Jr.; Buell, Scott; and Graham, James M., 4,712,092, Cl. 340-365.00A.

Gelula, Jerome D. Coupling system. 4,711,003, Cl. 24-631.000.

General American Transportation Corporation: *See*—
Mowatt-Larssen, Erling, 4,711,274, Cl. 141-5.000.

General Dynamics, Pomona Division: *See*—
Branigan, John T.; and Vess, David J., 4,712,110, Cl. 343-779.000.

General Electric Company: *See*—
Bulman, Melvin J., 4,711,153, Cl. 89-7.000.
Burgess, James F., 4,711,804, Cl. 428-210.000.
Forbes, Franklin L.; and Harms, Harold B., 4,712,035, Cl. 310-269.000.
Hatch, Burton D., 4,712,032, Cl. 310-178.000.
Lillquist, Robert D.; and Case, Allen W., Jr., 4,711,986, Cl. 219-130.010.
McCready, Russell J.; and Tyrell, John A., 4,711,933, Cl. 525-415.000.
McCready, Russell J.; and Tyrell, John A., 4,711,947, Cl. 528-288.000.
McCready, Russell J.; and Tyrell, John A., 4,711,948, Cl. 528-288.000.
Shah, Manoj R.; and Lenz, Henry G., 4,712,033, Cl. 310-178.000.
Simonson, Dale E.; and Stoll, Donald H., 4,712,157, Cl. 361-357.000.

General Foods Corporation: *See*—
Glasser, George M.; DeRobertis, Robert P.; Smithwrick, John H.; and Kelly, William J., 4,711,979, Cl. 219-10.55D.

General Instrument Corporation: *See*—
Frezza, William; Simons, Robert; and Westerfer, Richard, 4,712,239, Cl. 380-20.000.

General Ionex Corporation: *See*—
Naylor, Harry, 4,712,012, Cl. 250-423.00R.

General Mining Union Corporation, Limited: *See*—
Rawlings, Douglas E.; and Woods, David R., 4,711,849, Cl. 435-91.000.

General Motors Corporation: *See*—
Baker, Steven F., 4,711,202, Cl. 123-90.260.
Bazilio, Rayman E.; Hartz, James F.; and Uliana, Anthony R., 4,711,328, Cl. 188-296.000.
Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., 4,711,984, Cl. 219-110.000.
Bonvallet, Duane J., 4,711,207, Cl. 123-198.00F.
Cagle, Philip V., 4,711,124, Cl. 73-162.000.
Cinpinski, Kenneth J., 4,711,215, Cl. 123-425.000.
Cross, William E.; Hillestad, Jeanne E.; and Plyler, Robert G., 4,711,509, Cl. 439-587.000.
Davis, Ronald G.; Denniston, Charles D.; and Van Skyock, Richard K., 4,711,265, Cl. 137-454.200.
Duvenkamp, Manfred, 4,711,494, Cl. 297-403.000.
Eckhardt, Dennis C., 4,711,224, Cl. 123-572.000.
Goodbred, Neil G., 4,711,589, Cl. 384-34.000.
Graber, David W., 4,711,516, Cl. 350-96.150.
Hamren, Glen C., 4,711,119, Cl. 73-115.000.
Harvey, Douglas J., 4,711,288, Cl. 164-34.000.
Kabasin, Daniel F., 4,711,218, Cl. 123-492.000.
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,156, Cl. 92-31.000.
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,157, Cl. 92-31.000.
Kayyod, Fariborz; and Hoffman, Donald E., 4,711,158, Cl. 92-94.000.
Knable, Joseph J.; Ferdelman, Donald C.; and Bojanowski, Gerald M., 4,711,463, Cl. 280-668.000.
Lathers, Michael W.; and Bruning, Richard P., 4,711,496, Cl. 297-452.000.
Lederman, Frederick E., 4,711,330, Cl. 192-45.000.
McMahan, David R.; Hallgarth, Leslie H.; and Miller, Gary L., 4,712,164, Cl. 362-66.000.
Neuhalfen, Michael A.; Ridoux, Frank E.; and Edenborough, John S., 4,711,226, Cl. 123-609.000.
Rimmell, Herbert D.; and Perkins, John W., 4,711,527, Cl. 350-243.000.
Schrom, Ralf-H.; and Baltes, Horst, 4,711,493, Cl. 297-379.000.
Smith, Jack E., 4,711,190, Cl. 112-266.200.

General Signal Corporation: *See*—
Aver, John H., Jr.; and Petit, William A., 4,711,418, Cl. 246-5.000.

Genest, Leonard J. Electronic key code recording device. 4,711,995, Cl. 235-449.000.

Genetic Systems Corporation: *See*—
Nowinski, Robert C.; and Hoffman, Allan S., 4,711,840, Cl. 435-7.000.

Genetics International, Inc.: *See*—
Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., 4,711,245, Cl. 128-635.000.

Genschow, Henning; Heisel, Uwe; and Schuster, Joachim, to Werner and Kolb Werkzeugmaschinen GmbH. Flexible manufacturing unit. 4,711,016, Cl. 29-568.000.

George Fischer Ltd.: *See*—
Rietzscher, Rolf; Dersch, Stefan; and Riethmann, Max, 4,711,290, Cl. 164-66.100.

Georgis, Paul F., II. Remote temperature alarm for stoves. 4,712,095, Cl. 340-584.000.

Gerard, Philippe: *See*—
Capra, Thierry; and Gerard, Philippe, 4,711,694, Cl. 156-603.000.

Gerber Scientific Products, Inc.: *See*—
Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., 4,711,035, Cl. 33-200.000.

Gerling, John E. Frequency stabilized microwave power system and method. 4,711,983, Cl. 219-10.55A.

Geurts, Petrus A. M., to Oce-Nederland B.V. Sheet sorting device. 4,711,444, Cl. 271-290.000.

Geus, John W.: *See*—
Mesters, Carolus M. A. M.; Geus, John W.; and Kuijpers, Eugene G. M., 4,711,773, Cl. 423-655.000.

Ghusn, Abdallah E. Vehicle access control system. 4,711,608, Cl. 404-6.000.

Gick, Wilhelm: *See*—
Konkol, Werner; Bahrmann, Helmut; Dambkes, Georg; Gick, Wilhelm; Wiebus, Ernst; and Bach, Hanswilhelm, 4,711,648, Cl. 55-73.000.

Giersch, Wolfgang K.: *See*—
Schulte-Elte, Karl-Heinrich; Ohloff, Gunther; Muller, Bernard L.; and Giersch, Wolfgang K., 4,711,875, Cl. 512-1.000.

Giger, Urs: *See*—
Oechslin, Ludwig; Giger, Urs; and Sporing, Jorg, 4,711,583, Cl. 368-16.000.

Gilbaugh, James H., Jr.; and Willock, Charles B. Hand-held medical syringe actuator device. 4,711,250, Cl. 128-765.000.

Gilbert, Everett E., to United States of America, Army. Hexakis (2-nitroxethyl) melamine useful as an energetic plasticizer. 4,711,679, Cl. 149-96.000.

Gilhousen, Klein S.; Heller, Jerrold A.; Van Harding, Michael; and Blakeney, Robert D., II, to M/A-COM Government Systems, Inc.;

and Cable/Home Communication Corp. Selective-subscription descrambling. 4,712,238, Cl. 380-20.000.
Gillespie, Noah N. Vertical cross bow and removable stock assembly therefor. 4,711,228, Cl. 124-25.000.
Gimeno, Rene: *See*—
Huc, Alain; Gimeno, Rene; and Herbage, Daniel, 4,711,783, Cl. 424-460.000.
Ginat, Jonathan. Swivel tilt mechanism for chair. 4,711,491, Cl. 297-301.000.
Giraudi, Walter: *See*—
Radaelli, Dario; and Giraudi, Walter, 4,711,400, Cl. 239-585.000.
Gist-Brocades N.V.: *See*—
Tan, Hong S.; and Wegnian, Bernardus B. M., 4,711,777, Cl. 424-79.000.
Glaise, Rene J., to International Business Machines Corporation. Method and device for correcting errors in memories. 4,712,216, Cl. 371-38.000.
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, to Robert Bosch GmbH. Pressure measuring element. 4,711,130, Cl. 73-708.000.
Glasser, George M.; DeRobertis, Robert P.; Smithwrick, John H.; and Kelly, William J., to General Foods Corporation. Microwave oven video viewing device. 4,711,979, Cl. 219-10.55D.
Glassman, Jacob A. Surgical drape. 4,711,236, Cl. 128-132.00D.
Glickman, Michael N., to McCauley Corporation Limited. Paving block. 4,711,599, Cl. 404-41.000.
Glinecke, Hermann R.: *See*—
Polan, George S.; and Glinecke, Hermann R., 4,711,099, Cl. 62-457.000.
Glover, John B., to Hepworth Iron Company Ltd., The. Coupling pipes. 4,711,473, Cl. 285-235.000.
Gmoser, Johann; Paar, Willibald; and Honel, Michael, to Vianova Kunstharz, A.G. Self-crosslinking cationic paint binders containing urea and urethane groups and process of manufacture. 4,711,935, Cl. 525-452.000.
Gmoser, Johann: *See*—
Paar, Willibald; Honel, Michael; and Gmoser, Johann, 4,711,934, Cl. 525-452.000.
Godfrey, Dwaine A.: *See*—
Charbonneau, Arthur G.; Godfrey, Dwaine A.; McNennamy, John A.; and Nafziger, Steven, 4,712,071, Cl. 324-415.000.
Goedicke, Siegfried: *See*—
Albeck, Bernhard; and Goedicke, Siegfried, 4,711,019, Cl. 29-609.000.
Gold Star Co., Ltd.: *See*—
Gwon, Seong T., 4,711,410, Cl. 242-201.000.
Goldwasser, Benad; and Carson, Culley, to Duke University Patents Foundation. Surgical dissector. 4,711,240, Cl. 128-319.000.
Golick, Leonard R.: *See*—
Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, 4,711,755, Cl. 376-260.000.
Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, 4,711,759, Cl. 376-284.000.
Goller, Ernst; Muller, Adam; and Hermann, Udo, to H. Stoll GmbH & Co. Flat-bed knitting machine. 4,711,101, Cl. 66-64.000.
Gollinger, Wolfgang, to Deutsche ITT Industries GmbH. Cmos inverter. 4,712,021, Cl. 307-355.000.
Gontier, Alex: *See*—
Brison, Bernard; Galerneau, Jacques; Gontier, Alex; and Petrozzi, Gerard, 4,710,980, Cl. 2-50.000.
Good, Thomas J., to Analytichem International, Inc. Automatic sample injector and disposable sample cassette. 4,711,764, Cl. 422-65.000.
Goodbred, Neil G., to General Motors Corporation. Manual seat adjuster with cam lock. 4,711,589, Cl. 384-34.000.
Goodyear Tire & Rubber Company, The: *See*—
Bonko, Mark L.; and Lopp, Loran C., Jr., 4,711,283, Cl. 152-209.00B.
Gordin, Harvey H.: *See*—
Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., 4,711,255, Cl. 131-330.000.
Gordin, Myron K.; and Drost, James L., to Mycro Group Co. Remote control, moveable lighting system. 4,712,167, Cl. 362-233.000.
Gordon, Eric M.: *See*—
Varma, Ravi K.; and Gordon, Eric M., 4,711,900, Cl. 514-351.000.
Gordon, Robert L.: *See*—
Alba, Andrew J.; Griesemer, James A.; and Gordon, Robert L., 4,711,389, Cl. 229-1.50B.
Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, to Exxon Research and Engineering Company. Asphaltic composition. 4,711,672, Cl. 106-281.00R.
Gosselink, Eugene P.; and Diehl, Francis L., to Procter & Gamble Company, The. Capped 1,2-propylene terephthalate-polyoxyethylene terephthalate polyesters useful as soil release agents. 4,711,730, Cl. 252-8.750.
Gosset, Serge; and Lumaret, Jean-Claude, to Roquette Freres Societe Anonyme. Amylaceous composition for mixtures based on synthetic or natural binders employed in the manufacture of certian textile or paratextile products, particularly of the composite textile or fabric type. 4,711,794, Cl. 427-389.900.
Gotanda, Motohiro. Door lock control system. 4,712,103, Cl. 340-825.310.
Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, to Mitsubishi Kinzoku Kabushiki Kaisha. Copper converter. 4,711,433, Cl. 266-222.000.
Goto, Shinichi; and Ogiro, Kenji, to Hitachi Maxell, Ltd.; and Hitachi, Ltd. Recording tape cassette. 4,712,149, Cl. 360-132.000.
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Naruki, Toshimasa; and Goto, Toshihisa, 4,712,145, Cl. 360-96.500.
Goudy, Paul R., Jr.; and Weekley, William G., to Autotrol Corporation. Seal member for pellet dispenser. 4,711,370, Cl. 221-265.000.
Gould, Clive M.: *See*—
Callaghan, Ian C.; Gould, Clive M.; and Grabowski, Wojciech, 4,711,714, Cl. 208-348.000.
Gould Inc.: *See*—
Lach, Lawrence E., 4,712,061, Cl. 324-83.00D.
Gove, Gene G. Apparatus and method for making a counter top and product of same. 4,711,799, Cl. 428-119.000.
Graber, David W., to General Motors Corporation. Optical slip ring. 4,711,516, Cl. 350-96.150.
Grabowski, Wojciech: *See*—
Callaghan, Ian C.; Gould, Clive M.; and Grabowski, Wojciech, 4,711,714, Cl. 208-348.000.
Grace, Alan G. V., to Power Modifications Incorporated. Power supply having tuned radio frequency circuit. 4,712,170, Cl. 363-98.000.
Graham, James M.: *See*—
Boldridge, Austin, Jr.; Buell, Scott; and Graham, James M., 4,712,092, Cl. 340-365.00A.
Grandinetti, Paul M. Pivoting bar lock. 4,711,479, Cl. 292-272.000.
Green, Andrew P.: *See*—
Price, Anthony G.; Campbell, Roy; and Green, Andrew P., 4,711,327, Cl. 188-71.400.
Green, Joseph, to FMC Corporation. Flame retarded polycarbonate polymers. 4,711,931, Cl. 525-394.000.
Greenberg, Joel S., to Princeton Synergetics, Inc. Security system for correlating passengers and their baggage. 4,711,994, Cl. 235-384.000.
Gregory, Allen R. Capless retractable marking pen. 4,711,592, Cl. 401-107.000.
Gregory, Charles E., Jr.: *See*—
Gregory, Charles E., Sr.; Jordan, Bertram L.; and Gregory, Charles E., Jr., 4,711,403, Cl. 241-101.200.
Gregory, Charles E., Sr.; Jordan, Bertram L.; and Gregory, Charles E., Jr. Method and apparatus for cleaning chicken manure from chicken houses. 4,711,403, Cl. 241-101.200.
Greiner, Siegfried M.; and Palac, Kazimir, to Zenith Electronics Corporation. Color CRT tension mask support assembly with a glass frame. 4,712,041, Cl. 313-407.000.
Grenthe, Bo. Dry closet. 4,710,989, Cl. 4-449.000.
Greve, Peter F.: *See*—
Smid, Albert; Greve, Peter F.; and 't Lam, Hendrik, 4,712,205, Cl. 369-45.000.
Griesemer, James A.: *See*—
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Griffin, Dennis; and Field, Charles A., to Frazer-Nash Ltd. Missile launcher. 4,711,151, Cl. 89-1.805.
Griffing, Robert S.: *See*—
Chryssomallis, George; and Griffing, Robert S., 4,711,154, Cl. 89-7.000.
Grobmyer, Louis R.: *See*—
Miller, Reno W.; and Grobmyer, Louis R., 4,711,753, Cl. 376-216.000.
Grollius, Horst W.: *See*—
Wasel, Horst P.; and Grollius, Horst W., 4,711,706, Cl. 204-129.650.
Grootentraast, Johannes P.: *See*—
Pothast, Lambertus A.; Grootentraast, Johannes P.; and Verdonschot, Joannes F. J., 4,711,562, Cl. 355-16.000.
Grosman, Isaac. Method of installing offshore constructions. 4,711,601, Cl. 405-204.000.
Gross, Jonathan; and Marten, O. James, to Mobil Oil Corporation. Annular extrusion die with internal choke ring and spider mandrel. 4,711,623, Cl. 425-376.00A.
Grossmann, Jurg; and Grossmann, Marcel. Fastening of a covering material to a substratum. 4,711,681, Cl. 156-71.000.
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Grossmann, Jurg; and Grossmann, Marcel, 4,711,681, Cl. 156-71.000.
Grosso, Carl: *See*—
Wilkinson, Blair E., 4,711,579, Cl. 356-375.000.
Gruenbaum, William T.; Harmon, Julie P.; and Roberts, Luther C., to Eastman Kodak Company. Colored electroscopic toners containing quenched esterified rhodamine dyes. 4,711,832, Cl. 430-106.000.
Grundei, Hans, to S+G Implants GmbH. Anchorage for tibia plates. 4,711,639, Cl. 623-20.000.
Grundy Dispense Systems, Inc.: *See*—
Brown, Anthony D., 4,711,377, Cl. 222-400.700.
Grzeskowiak, Nicholas E.; and Philip, James B., Jr., to Minnesota Mining and Manufacturing Company. Photographic elements sensitive to near infrared. 4,711,838, Cl. 430-568.000.
GTE Laboratories Incorporated: *See*—
Butler, Scott J.; Smith, Robert K.; and Abdollahian, Mehdy, 4,712,046, Cl. 315-248.000.
GTE Products Corporation: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,711,660, Cl. 75-0.50B.
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,711,661, Cl. 75-0.50B.
Mizuhara, Howard, 4,711,386, Cl. 228-121.000.
Shank, Jeffrey B.; Swanson, Steven E.; and Opdahl, Barry J., 4,711,518, Cl. 350-96.200.
Guarino, Nicholas, to Micrion Limited Partnership. Mask holding. 4,711,438, Cl. 269-152.000.

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Franchina, Thomas F.; Gudmundson, Gunnar G.; and Reuss, John R., 4,711,565, Cl. 355-39.000.

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Fredericks, Kenneth J.; Guerriero, Thomas W.; Miracle, Gerald H.; and Wiegand, Michael R., 4,712,176, Cl. 364-200.000.

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Guigonis, Jacques: *See*—
Rogier, Serge; and Guigonis, Jacques, 4,711,298, Cl. 165-165.000.

Gulette, Ronald S.; and Charen, Grace M., to Irvin Industries, Inc. Motor vehicle visor with removable mirror assembly. 4,711,483, Cl. 296-97.00C.

Gulley, Harold J. Coolant additive with corrosion inhibitive and scale preventative properties. 4,711,735, Cl. 252-75.000.

Gurich, Gunter L., to FEV Forschungsgesselschaft fur Energie-Technik und Verbrennungsmotoren mbH. Pressure transducer having a piezoelectric element for pressure measurements at high temperatures particularly for the combustion chamber pressure of internal combustion engines. 4,712,036, Cl. 310-333.000.

Guse, Gunter: *See*—
Nick, Erich; Guse, Gunter; and Asmussen, Bodo, 4,711,781, Cl. 424-446.000.

Gusman, Moisei T.: *See*—
Baldenko, Dmitry F.; Bezlepkin, Nikolai P.; Vadetsky, Jury V.; Gusman, Moisei T.; Potapov, Jury F.; and Semenets, Valery I., 4,711,006, Cl. 29-156.40R.

Gwilliam, Tony S.; and Ohu, Russell. Octet structures using tension and compression. 4,711,062, Cl. 52-646.000.

Gwon, Seong T., to Gold Star Co., Ltd. Reel-driving device for a videocassette recorder. 4,711,410, Cl. 242-201.000.

H. Stoll GmbH & Co.: *See*—
Goller, Ernst; Muller, Adam; and Hermann, Udo, 4,711,101, Cl. 66-64.000.

Haacker, Heinz; and Wensing, Helmut, to MAN Gutehoffnungshutte GmbH. Rotary tube cooler construction. 4,711,297, Cl. 165-88.000.

Haag, Donald L. Spring disc. 4,711,434, Cl. 267-161.000.

Haas, Max, to Inventio AG. Door drive for doors of elevator cars. 4,711,323, Cl. 187-52.00R.

Haddock, Richard: *See*—
Drexler, Jerome; and Haddock, Richard, 4,711,347, Cl. 206-38.000.

Haefner, Guenther: *See*—
Letsche, Ulrich; Rapp, Wolfgang, deceased; Haefner, Guenther; and Tonhaeuser, Wilhelm, 4,711,220, Cl. 123-502.000.

Hafner, Hans W., to Pfister GmbH. Method and apparatus for measuring the pressure of a fluid. 4,711,127, Cl. 73-302.000.

Hagenah, Gerhard: *See*—
Leling, Menno; and Hagenah, Gerhard, 4,711,606, Cl. 405-286.000.

Hagenbruch, Bernd: *See*—
Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, 4,711,896, Cl. 514-570.000.

Haghiri-Tehrani, Yahya, to GAO Gesellschaft fur Automation und Organisation mbH. Method for making an identification card having features for testing in incident and transmitted light. 4,711,690, Cl. 156-309.600.

Haginoya, Tsutomu: *See*—
Kitaori, Tadahiro; Haginoya, Tsutomu; and Kozakura, Nobuto, 4,711,676, Cl. 148-319.000.

Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, to Nippon Steel Corporation; and Harima Refractory Co., Ltd. Inorganic filler dispersed-resin composition. 4,711,916, Cl. 523-223.000.

Haimova, Marieta A.: *See*—
Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Veselina B; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.

Hakhverdian, Armik A. Capacitive displacement transducer for generating electrical signals corresponding to single-valued functions. 4,712,107, Cl. 340-870.370.

Hale, John M.: *See*—
Wright, Harry D.; Hale, John M.; and Weber, Eugen, 4,711,703, Cl. 204-1.00T.

Hall, Heinrich: *See*—
Haller, Andreas; Pfundstein, Werner; and Hall, Heinrich, 4,711,991, Cl. 235-132.00E.

Haller, Andreas; Pfundstein, Werner; and Hall, Heinrich, to IVO Irion & Vosseler Zahlerfabrik GmbH & Co. Counting apparatus. 4,711,991, Cl. 235-132.00E.

Hallgarth, Leslie H.: *See*—
McMahan, David R.; Hallgarth, Leslie H.; and Miller, Gary L., 4,712,164, Cl. 362-66.000.

Halliburton Company: *See*—
Christensen, Jon B., 4,711,123, Cl. 73-151.000.
Ringgenberg, Paul D., 4,711,305, Cl. 166-336.000.

Halter, Hartmut, to Reifenhauser GmbH & Co. Method of producing blown thermoplastic foil with low thickness tolerances. 4,711,747, Cl. 264-40.200.

Hamada, Tadatsugu: *See*—
Kuwabara, Hideki; Naito, Masato; Watanabe, Teishiro; and Hamada, Tadatsugu, 4,711,287, Cl. 165-34.000.

Hamamoto, Masaya: *See*—
Maebayashi, Jiro; and Hamamoto, Masaya, 4,711,485, Cl. 296-108.000.

Hamm, Robert W., to AccSys Technology, Inc. Variable frequency RFQ linear accelerator. 4,712,042, Cl. 315-5.410.

Hammann, Ingeborg: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,711,905, Cl. 514-522.000.

Hamren, Glen C., to General Motors Corporation. Peak combustion pressure signal processing circuit with diagnostic capability. 4,711,119, Cl. 73-115.000.

Hanai, Kazuko; and Yamada, Yasuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,711,819, Cl. 428-425.900.

Hanamure, Toshiyuki: *See*—
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamure, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.

Hanayama, Fumihiko: *See*—
Ishida, Tetsuyoshi; Okiura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, 4,711,828, Cl. 429-12.000.

Handfield, Louis. Method and apparatus for making snow. 4,711,395, Cl. 239-14.200.

Handler, Milton E.; and Baisch, Herbert, to Hirsh Company. Shelving assembly with drop-in shelf. 4,711,183, Cl. 108-111.000.

Handy, Roland J.: *See*—
Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., 4,712,137, Cl. 358-213.290.

Hann, William M.: *See*—
Amick, David R.; Hann, William M.; and Natoli, John, 4,711,725, Cl. 210-701.000.

Hannah, Daniel E.; Miliczky, Eugene W.; Bea, Clifford F.; and Hannah, Martin J., to Advanced Thermal Systems, Inc. Method for removing injectable material from a packing cylinder. 4,711,013, Cl. 29-402.020.

Hannah, Martin J.: *See*—
Hannah, Daniel E.; Miliczky, Eugene W.; Bea, Clifford F.; and Hannah, Martin J., 4,711,013, Cl. 29-402.020.

Hansen, Marcia K.: *See*—
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Hanson, Alden W., to Hanson, Helen L. Knot. 4,711,476, Cl. 289-1.200.

Hanson, Helen L.: *See*—
Hanson, Alden W., 4,711,476, Cl. 289-1.200.

Harada, Akihisa, to Nippon Jiryoku Senko Co., Ltd. Process for the simultaneous treatment of dust, sludge and steel slag. 4,711,662, Cl. 75-1.00R.

Haraguchi, Hiroshi; and Sakakibara, Koji, to Nippondenso Co., Ltd. Anti-knocking in internal combustion engine. 4,711,212, Cl. 123-425.000.

Haraguchi, Hiroshi: *See*—
Sakakibara, Koji; and Haraguchi, Hiroshi, 4,711,213, Cl. 123-425.000.
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Harder, Christoph S.; Jaeckel, Heinz; and Wolf, Hans P., to International Business Machines Corporation. Method of fabricating a self-aligned metal-semiconductor FET having an insulator spacer. 4,711,858, Cl. 437-99.000.

Harima Refractory Co., Ltd.: *See*—
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.

Harmon, Julie P.: *See*—
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Harms, Harold B.: *See*—
Forbes, Franklin L.; and Harms, Harold B., 4,712,035, Cl. 310-269.000.

Harper, Robert J., Jr., to United States of America, Agriculture. Process for crossdyeing cellulosic fabrics. 4,711,640, Cl. 8-481.000.

Harrigan, Donald R. Card dispenser guard apparatus. 4,711,371, Cl. 221-310.000.

Harris, David H.: *See*—
Steuer, Robert R.; and Harris, David H., 4,711,248, Cl. 128-748.000.

Harris, Donald L., to Cordis Corporation. Implantable lead construction. 4,711,027, Cl. 29-869.000.

Harris, John L.; and Benyon, John F. Apparatus for hydraulic damping. 4,711,435, Cl. 267-221.000.

Harris, Rod W. Tape dispensing device. 4,711,384, Cl. 225-66.000.

Harrison, James J.: *See*—
Beach, David L.; and Harrison, James J., 4,711,969, Cl. 585-511.000.

Hartenstein, Johannes: *See*—
Satzinger, Gerhard; Hartenstein, Johannes; Mannhardt, Karl; Kleinschroth, Jurgen; Osswald, Hartmut; Weinheimer, Gunter; and Fritschi, Edgar, 4,711,901, Cl. 514-300.000.

Hartiala, Eero; Kuusento, Jaakko; and Paasonen, Hannu, to Oy Tampella Ab. Method of and device for adjusting the feed movement of a drill rod for drilling a rock. 4,711,090, Cl. 60-422.000.

Hartmann, Albert: *See*—
Baschang, Gerhard; Hartmann, Albert; and Wacker, Oskar, 4,711,879, Cl. 514-42.000.

Hartz, James F.: *See*—
Bazilio, Rayman E.; Hartz, James F.; and Uliana, Anthony R., 4,711,328, Cl. 188-296.000.

Harumoto Iron Works Co., Ltd.: *See*—
Kishida, Hiroo; and Takenaka, Hirofumi, 4,710,994, Cl. 14-1.000.

Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, to Canon Kabushiki Kaisha. Image recording material comprising photosensitive layer and recording layer on electroconductive base. 4,711,830, Cl. 430-52.000.

Harvey, Alexander, to United States of America, Energy. Vacuum chamber for containing particle beams. 4,712,074, Cl. 328-233.000.

Harvey, Douglas J., to General Motors Corporation. Halide treatment for aluminum lost foam casting process. 4,711,288, Cl. 164-34.000.

Harvey, Thomas B., III, to Sola U.S.A. Inc. Hydrophilic siloxane monomers and dimers for contact lens materials, and contact lenses fabricated therefrom. 4,711,943, Cl. 526-279.000.

Hasegawa, Shigekazu; Machida, Satoshi; and Oota, Yoshimi, to Kubota, Ltd. Hydraulic circuit construction for power shift transmission. 4,711,329, Cl. 192-3.570.

Hashimoto, Hiroshi: *See*—
Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, 4,712,118, Cl. 346-108.000.

Hashimoto, Kazuo. Automatic measuring/alarm apparatus for measuring radioactive concentration or the like. 4,712,097, Cl. 379-40.000.

Hashimoto, Seiji; Kinoshita, Takao; and Tanaka, Nobuyoshi, to Canon Kabushiki Kaisha. Image pickup apparatus. 4,712,135, Cl. 358-213.220.

Hatanaka, Masayuki: *See*—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.

Hatano, Masakatsu; Oshima, Kazunori; Ihara, Tatsuya; and Kiyono, Kenichi, to Mitsubishi Chemical Industries Limited. Catalytic composition. 4,711,867, Cl. 502-205.000.

Hatch, Burton D., to General Electric Company. Liquid metal circulation in an acyclic generator collector. 4,712,032, Cl. 310-178.000.

Hatta, Keizo, to Yoshidg Kogyo K. K. Apparatus for continuously thermally treating elongate textile products. 4,711,040, Cl. 34-73.000.

Hattori, Tadashi: *See*—
Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, 4,712,082, Cl. 338-4.000.

Hattori, Takeo: *See*—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.

Haugerud, Albert R. Computer controllable robotic educational toy. 4,712,1?4, Cl. 364-513.000.

Hausberg, Hans-Heinrich; Bottcher, Henning; Seyfried, Christoph; and Bergmann, Rolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Use of hydroxyindole derivatives in lowering blood pressure. 4,711,893, Cl. 514-339.000.

Hawrylko, Roman B., to B. F. Goodrich Company, The. Skinless porous particle PVC resin and process for producing same. 4,711,908, Cl. 521-56.000.

Hayakawa, Naohiro: *See*—
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.

Hayase, Isao: *See*—
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Hayashi, Keijiro; and Awano, Toshimi, to Mizuno Corporation. Injection ski and a method of manufacturing same. 4,711,462, Cl. 280-610.000.

Hayashi, Yuko: *See*—
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamure, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.

Hayashida, Morimasa: *See*—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.

Haybuster Manufacturing, Inc.: *See*—
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Hayes Industrial Brake, Inc.: *See*—
Prusak, Allan E., 4,711,092, Cl. 60-534.000.

Haynes, William L.: *See*—
Gadkaree, Kishor P.; Haynes, William L.; and Lu, Kun-Er, 4,711,860, Cl. 501-9.000.

Hazato, Atsuo; Sugiura, Satsohi; Kurozumi, Seizi; and Noyori, Ryoji, to Teijin Limited. 4-hydroxy-2-cyclopentenone, process for production thereof, pharmaceutical composition comprising it. 4,711,895, Cl. 514-530.000.

Heard, Charles M.; and Yang, Frank C., to Hughes Aircraft Company. Adaptive recursive phase offset tracking system. 4,712,222, Cl. 375-77.000.

Hebrock, Steve: *See*—
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Hecht, Hans: *See*—
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.

Heck, Wolfgang; Kersten, Peter; and Volz, Hans, to Alcatel N. V. Position sensor. 4,712,083, Cl. 338-32.00R.

Hedlund, Bo. Device for metering liquid media, particularly lubricants. 4,711,321, Cl. 184-7.400.

Heidelberger Druckmaschinen AG: *See*—
Beisel, Hermann, 4,711,174, Cl. 101-352.000.

Heidenreich, Holger; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. 3-thienylazo dyes with a gamma-acid coupler. 4,711,954, Cl. 534-780.000.

Heilmeier & Weinlein Fabrik fur Oel-Hydraulic GmbH & Co. KG: *See*—
Brunner, Rudolf, 4,711,155, Cl. 91-446.000.

Heimer, Malcolm L., to Cordis Corporation. Method and apparatus for calibrating internal measurements of an implanted cardiac pacer. 4,712,179, Cl. 364-417.000.

Heimsoth, Harald; and Herbst, Thomas, to Dyckerhoff & Widmann Aktiengesellschaft. Method of and apparatus for installing an anchor member below water level through a wall into a soil formation. 4,711,604, Cl. 405-260.000.

Heinrich Wilhelmi GmbH & Co.: *See*—
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Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, to Didier-Werke AG. Gas washing device. 4,711,432, Cl. 266-220.000.

Heisel, Uwe: *See*—
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Held, Kurt. Sealing arrangement for a double band press. 4,711,168, Cl. 100-154.000.

Heller, Jerrold A.: *See*—
Gilhousen, Klein S.; Heller, Jerrold A.; Van Harding, Michael; and Blakeney, Robert D., II, 4,712,238, Cl. 380-20.000.

Heligren, Keijo, to Asea AB. Forming press mat utilizes trays formed of thin bottom plates and separate annular frames. 4,711,111, Cl. 72-63.000.

Helterbrand, David L. Spare tire carrier. 4,711,382, Cl. 224-42.230.

Henderson Doors Limited: *See*—
Fretwell, Percy, 4,711,613, Cl. 414-550.000.

Hendrix, Gary J.: *See*—
Kwun, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.

Hengl, Gerhard G. Massag..ag apparatus for the lower extremities of the body. 4,711,229, Cl. 128-49.000.

Henkel Corporation: *See*—
Wenzel, Bruce E.; and Clark, James P., 4,711,894, Cl. 514-458.000.

Henkel, Dietmar, to MAN Nutzfahrzeuge GmbH. Fuel injection system for self-ignition internal combustion engines. 4,711,209, Cl. 123-300.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Stahl, Peter H.; and Schmitz, Beat, 4,711,880, Cl. 514-108.000.

Hennings, David; and Manoukian, Nubar, to Coherent, Inc. Attenuating beam splitter. 4,711,526, Cl. 350-170.000.

Henry, Arnold W., to Xerox Corporation. Fusing member for electrostatographic reproducing apparatus. 4,711,818, Cl. 428-421.000.

Henry, Richard T.: *See*—
Martin, Timothy J., Jr.; and Henry, Richard T., 4,711,259, Cl. 134-166.00R.

Hepworth Iron Company Ltd., The: *See*—
Glover, John B., 4,711,473, Cl. 285-235.000.

Herbage, Daniel: *See*—
Huc, Alain; Gimeno, Rene; and Herbage, Daniel, 4,711,783, Cl. 424-460.000.

Herbst, Thomas: *See*—
Heimsoth, Harald; and Herbst, Thomas, 4,711,604, Cl. 405-260.000.

Hercher, Michael: *See*—
Wijntjes, Geert; and Hercher, Michael, 4,711,573, Cl. 356-346.000.

Hermann, Udo: *See*—
Goller, Ernst; Muller, Adam; and Hermann, Udo, 4,711,101, Cl. 66-64.000.

Hermida, Felipe U. Last-case for cleaning footwear. 4,710,997, Cl. 15-268.000.

Hernandez, William: *See*—
Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., 4,711,035, Cl. 33-200.000.

Herrgord, Donald E. Lightweight multi-panel display. 4,711,046, Cl. 40-605.000.

Herrington, Richard A.; Kleman, Thomas G.; and Apolinar, Ermelinda A., to Libbey-Owens-Ford Co. Abrasive fluid jet radius edge cutting of glass. 4,711,056, Cl. 51-410.000.

Hettich, Gerhard: *See*—
Eckardt, Dieter; and Hettich, Gerhard, 4,712,064, Cl. 324-208.000.

Hewlett-Packard Company: *See*—
Baldwin, Richard R., 4,711,574, Cl. 356-349.000.

Hidaka, Hideto: *See*—
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.

Hieda, Teruo: *See*—
Kyuma, Kenji; and Hieda, Teruo, 4,712,138, Cl. 358-213.310.

Higashi, Kazutada: *See*—
Ohta, Tomozo; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,712,111, Cl. 343-779.000.

Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., to Genetics International, Inc. Sensor for components of a liquid mixture. 4,711,245, Cl. 128-635.000.

Hill, Donnie K.: *See*—
Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A., 4,711,651, Cl. 62-34.000.

Hill, Hugh A. O.: *See*—
Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., 4,711,245, Cl. 128-635.000.

Hillestad, Jeanne E.: *See*—
Cross, William E.; Hillestad, Jeanne E.; and Plyler, Robert G., 4,711,509, Cl. 439-587.000.

Hillman, Theodore E., to USG Acoustical Products Company. Soft textured reveal edge ceiling board and process for its manufacture. 4,711,685, Cl. 156-220.000.
Hilti Aktiengesellschaft: *See*—
Blaas, Karl; and Nipp, Hansjorg, 4,711,308, Cl. 173-162.00R.
Jochum, Peter, 4,711,385, Cl. 227-10.000.
Wezel, Erich, 4,711,457, Cl. 279-65.000.
Hinchey, Richard J.: *See*—
Pellet, Regis J.; and Hinchey, Richard J., 4,711,864, Cl. 502-65.000.
Hirano, Katsuhiko: *See*—
Takeda, Fumiteru; Hirano, Katsuhiko; and Inagaki, Yoshihiro, 4,711,148, Cl. 84-1.010.
Hirsh Company: *See*—
Handler, Milton E.; and Baisch, Herbert, 4,711,183, Cl. 108-111.000.
Hisamori, Youichi: *See*—
Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, 4,711,091, Cl. 60-517.000.
Hitachi Automotive Engineering Co., Ltd.: *See*—
Takahashi, Yukio; Hayase, Isao; Amano. Keijirou; Mizukami, Masao; and Ishiguri, Masaaki, 4,711,620, Cl. 418-96.000.
Hitachi, Ltd.: *See*—
Goto, Shinichi; and Ogiro, Kenji, 4,712,149, Cl. 360-132.000.
Mohri, Shunji, 4,712,189, Cl. 364-900.000.
Nagasawa, Kiyoshi; Inoue, Toru; and Kashiwazaki, Susumu, 4,712,050, Cl. 318-254.000.
Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, 4,712,218, Cl. 372-38.000.
Omae, Tsutomu; Obara, Sanshiro; Kubo, Kenji; and Watanabe, Masahiko, 4,712,052, Cl. 318-625.000.
Saito, Atsushi; Ojima, Masahiro; Maeda, Takeshi; and Kato Tsuyoshi, 4,712,203, Cl. 369-13.000.
Takahashi, Yukio; Hayase, Isao; Amano, Keijirou; Mizukami, Masao; and Ishiguri, Masaaki, 4,711,620, Cl. 418-96.000.
Tanimura, Nobuyoshi; and Yasui, Tokumasa, 4,712,192, Cl. 365-51.000.
Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, 4,712,175, Cl. 364-200.000.
Wakamori, Fumio; Ohata, Hideo; Miyaoka, Shinichiro; and Funabashi, Motohisa, 4,712,182, Cl. 364-507.000.
Hitachi Maxell, Ltd.: *See*—
Goto, Shinichi; and Ogiro, Kenji, 4,712,149, Cl. 360-132.000.
Ho, James C.: *See*—
Oberly, Charles E.; Gegel, Harold L.; and Ho, James C., 4,711,825, Cl. 428-614.000.
Hodlewsky, Wasyly G., to Rexnord Inc. Key apparatus. 4,711,605, Cl. 403-355.000.
Hoechst Aktiengesellschaft: *See*—
Dittmar, Walter; Futterer, Eberhard; and Lohaus, Gerhard, 4,711,775, Cl. 424-70.000.
Hoechst Celanese Corporation: *See*—
Choe, Eui W., 4,711,532, Cl. 350-354.000.
Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, to BASF Aktiengesellschaft. Honeycomb catalyst and its preparation. 4,711,930, Cl. 502-209.000.
Hoffman, Allan S.: *See*—
Nowinski, Robert C.; and Hoffman, Allan S., 4,711,840, Cl. 435-7.000.
Hoffman, Donald E.: *See*—
Kayyod, Fariborz; and Hoffman, Donald E., 4,711,158, Cl. 92-94.000.
Hoffman-La Roche Inc.: *See*—
Brombacher, Urs; Link, Helmut; and Montavon, Marc, 4,711,889, Cl. 514-297.000.
Hoffmann, Joachim, to Esjot-Werke Schiermeister & Junker GmbH & Co. KG. Freewheel overrunning clutch, particularly for a two-wheel vehicle. 4,711,331, Cl. 192-46.000.
Hofmann, Jurgen; Huschka, Hans; and Neupert, Daniel, to Nukem GmbH. Process and apparatus for the decomposition of halogen and/or phosphoric containing organic materials. 4,711,185, Cl. 110-215.000.
Hofmann, Manfred: *See*—
Andraa , Rainer; and Hofmann, Manfred, 4,711,206, Cl. 123-192.00R.
Hohlwegler, Heinz: *See*—
Schaible, Siegfried; Hohlwegler, Heinz; and Kohl, Bernhard, 4,711,078, Cl. 56-341.000.
Holbrook, Nicholas: *See*—
Wilkinson, John; and Holbrook, Nicholas, 4,711,061, Cl. 52-410.000.
Holcombe, Cressie E., Jr.: *See*—
Chapman, Lloyd R.; and Holcombe, Cressie E., Jr., 4,711,666, Cl. 106-14.120.
Holdeman, David A.: *See*—
Langenbeck, Keith A.; and Holdeman, David A., 4,711,357, Cl. 209-565.000.
Holderle, Hans; Wolf, Jurgen; Eckhart, Horst; and Vonderau, Werner, to Andreas Stihl. Connecting piece between the carburetor and the combustion chamber of an internal combustion engine. 4,711,225, Cl. 123-590.000.
Hollingsworth UK, Ltd.: *See*—
Clough, Douglas O., 4,711,083, Cl. 57-301.000.
Holly, Arthur C.: *See*—
Bailey, Rick S.; and Holly, Arthur C., 4,712,060, Cl. 324-83.00R.
Holtgraver, Edward G., to Keystone International, Inc. Apparatus for connecting a valve element to a valve stem. 4,711,427, Cl. 251-308.000.
Holze, Ernest P., Jr., to Branson Ultrasonics Corp. Anvil for ultrasonic slitting apparatus. 4,711,693, Cl. 156-580.100.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kano, Hidekazu; Shinchi, Takashi; and Hosoi, Shuichi, 4,711,217, Cl. 123-491.000.
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
Ooyama, Kazuo; Ooki, Kenji; and Mizushima, Toshio, 4,711,201, Cl. 123-73.00A.
Shiina, Haruo, 4,711,823, Cl. 428-547.000.
Honda, Yasuhiro: *See*—
Yuyama, Yukihiro; Motosugi, Takanori; Honda, Yasuhiro; and Ichikawa, Akira, 4,711,874, Cl. 503-206.000.
Honel, Michael: *See*—
Gmoser, Johann; Paar, Willibald; and Honel, Michael, 4,711,935, Cl. 525-452.000.
Paar, Willibald; Honel, Michael; and Gmoser, Johann, 4,711,934, Cl. 525-452.000.
Honeywell Inc.: *See*—
Cates, Marion H.; and Szonntagh, E. gene L., 4,711,765, Cl. 422-89.000.
Jenekhe, Samson A.; and Hansen, Marcia K., 4,711,946, Cl. 528-251.000.
Vu, Tho T., 4,712,022, Cl. 307-448.000.
Honeywell Information Systems Inc.: *See*—
Russell, Robert J., 4,711,024, Cl. 29-832.000.
Hong, Lazaro M. Vacuum integrated circuit. 4,712,039, Cl. 313-307.000.
Hongo, Yasuo, to Fuji Electric Company, Ltd. Method and apparatus for object identification. 4,712,248, Cl. 382-22.000.
Honguu, Kazuoki: *See*—
Kikuchi, Kazuhiko; Honguu, Kazuoki; and Sawamura, Mitsuharu, 4,711,821, Cl. 428-457.000.
Honma, Toshio: *See*—
Tanioka, Hiroshi; and Honma, Toshio, 4,711,558, Cl. 355-14.00R.
Honny Chemicals Company Ltd.: *See*—
Kojima, Masaki; and Munekata, Seiji, 4,711,926, Cl. 524-512.000.
Hood, Paul F., to Stone Container Corporation. Protective containerboard. 4,711,702, Cl. 162-123.000.
Hoogovens Groep B.V.: *See*—
van Breda, Jacques; and Pronk, Cornelis, 4,711,704, Cl. 204-28.000.
Hopkins, Daniel N., to Mobil Oil Corporation. Method and apparatus for determining crack initiation and propagation in metals. 4,711,131, Cl. 73-799.000.
Horbaschek, Heinz, to Siemens Aktiengesellschaft. Stereoscopic x-ray tube. 4,712,226, Cl. 378-134.000.
Horber, Ralph W., to Sigma Instruments, Inc. Magnetically assisted stepping motor. 4,712,028, Cl. 310-49.00R.
Horecky, Carl J.: *See*—
Cartmell, Robert R.; and Horecky, Carl J., 4,711,766, Cl. 422-140.000.
Horgan, William J., Jr., to Blumcraft of Pittsburgh. Latch actuating door handles. 4,711,480, Cl. 292-336.300.
Hori, Kenjiro: *See*—
Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, 4,712,118, Cl. 346-108.000.
Horie, Tsuneo: *See*—
Okazaki, Atsushi; Igarashi, Masahiko; and Horie, Tsuneo, 4,712,084, Cl. 338-184.000.
Horio, Yashuhiko: *See*—
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, 4,712,160, Cl. 361-388.000.
Horita, Yoshiyuki: *See*—
Watanabe, Kozo; Kando, Akiyoshi; and Horita, Yoshiyuki, 4,711,020, Cl. 29-767.000.
Horiuchi, Yusuke; and Inui, Masaki, to Toyota Jidosha Kabushiki Kaisha. Vibration damping structure of shift lever retainer. 4,711,135, Cl. 74-473.00R.
Horodysky, Andrew G.; and Law, Derek A., to Mobil Oil Corporation. Sulfurized olefins as antiwear/extreme pressure additives for lubricants and fuels and compositions thereof. 4,711,736, Cl. 252-47.500.
Horowski, Reinhard: *See*—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
Hosaka, Masao; and Saito, Takashi, to Canon Kabushiki Kaisha. Image processing apparatus. 4,711,560, Cl. 355-14.00C.
Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, to Nippondenso Co., Ltd. Ceramic heater. 4,711,990, Cl. 219-552.000.
Hosiden Electronics Co., Ltd.: *See*—
Tanaka, Masanori, 4,711,506, Cl. 439-108.000.
Hosoi, Shuichi: *See*—
Kano, Hidekazu; Shinchi, Takashi; and Hosoi, Shuichi, 4,711,217, Cl. 123-491.000.
Hou, Kenneth C.: *See*—
Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., 4,711,793, Cl. 427-244.000.
Houpt, Pieter M.; and Wielandt, Ralph T., to 501 Nederlandse Centrale Organisatie Voor Toegepast-Enschappelijk Onderzoek. Sensor for

the measurement of the refractive index of a fluid and/or phase boundary between two fluids by means of visible or invisible light. 4,711,126, Cl. 73-293.000.

Houser, John, Jr., to Singer Company, The. Battery charger circuit. 4,712,055, Cl. 320-35.000.

Houserman, Raymond L., to Coin Acceptors, Inc. Operation completion detection means. 4,712,049, Cl. 318-112.000.

Howe, Geoff: *See—*
Michels, Dennis; Howe, Geoff; and Joseph, Douglas, 4,712,250, Cl. 455-20.000.

Howland, Leland L.; and Seshadri, Jayaram, to Thermo King Corporation. Compartmentalized transport refrigeration system. 4,711,095, Cl. 62-117.000.

Hoyme, Clifford L. Damper mounting assembly. 4,711,626, Cl. 431-20.000.

Hubbell Incorporated: *See—*
Quiogue, Honesto D., 4,712,162, Cl. 361-417.000.
Schnell, Kenneth R., 4,711,472, Cl. 285-162.000.

Huc, Alain; Gimeno, Rene; and Herbage, Daniel, to Bioetica, S.A. Forms of microencapsulation of medicinal substances by homogeneous layers of native collagen. 4,711,783, Cl. 424-460.000.

Hughes Aircraft Company: *See—*
Alm, Ake W., 4,712,010, Cl. 250-334.000.
Heard, Charles M.; and Yang, Frank C., 4,712,222, Cl. 375-77.000.
Steffy, David A., 4,711,417, Cl. 244-158.00R.
Takamine, Henry K., 4,712,062, Cl. 324-158.00F.
Tangonan, Gregory L.; Yen, Huan-Wun; and Persechini, David L., 4,711,514, Cl. 350-96.120.

Hughes Tool Company: *See—*
Baugh, John L.; and Foster, Joe, 4,711,326, Cl. 188-67.000.

Hugon, Pierre: *See—*
Wierzbicki, Michel; Hugon, Pierre; and Poignant, Jean-Claude, 4,711,885, Cl. 514-253.000.

Hull-Allen, Gregory, to Mechanical Technology Incorporated. Optical configuration of fiber optic sensor for symmetric dynamic response about the optical null. 4,711,577, Cl. 356-373.000.

Hull, Ezekiel H.; and Frappier, Edward P., to Morflex Chemical Company, Inc. Citrate esters and methods. 4,711,922, Cl. 524-310.000.

Huls Aktiengesellschaft: *See—*
Mumcu, Salih; Panoch, Hans J.; and Rueter, Joern, 4,711,925, Cl. 524-417.000.

Hummel, Peter; and Steuer, Joachim, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink dispensing means for printing presses. 4,711,175, Cl. 101-365.000.

Hunter Associates Laboratory, Inc.: *See—*
Venable, William H., 4,711,580, Cl. 356-406.000.

Huschka, Hans: *See—*
Hofmann, Jurgen; Huschka, Hans; and Neupert, Daniel, 4,711,185, Cl. 110-215.000.

Hussmann Corporation: *See—*
Ares, Roland A.; Jones, Robert A.; and Street, Norman E., 4,711,094, Cl. 62-90.000.

Hydra-Level, Inc.: *See—*
Carpenter, Willis M., 4,711,428, Cl. 254-423.000.

Hydro-Pulse, Inc.: *See—*
Wiseman, Michael D., 4,711,272, Cl. 137-887.000.

Hydrolux S.a.r.l.: *See—*
Schwelm, Hans, 4,711,267, Cl. 137-596.150.

Hyduck, Steven J. Pick for stringed instruments. 4,711,150, Cl. 84-322.000.

Ibanez, Rene L. Golf cart umbrella mount bracket. 4,711,422, Cl. 248-515.000.

Ibrahim, Abd-El-Fattah A.: *See—*
Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., 4,712,137, Cl. 358-213.290.

Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, to Kowa Company Ltd. Ophthalmic disease detection apparatus. 4,711,542, Cl. 351-221.000.

Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,711,837, Cl. 430-548.000.

Ichikawa, Akira: *See—*
Yuyama, Yukihiro; Motosugi, Takanori; Honda, Yasuhiro; and Ichikawa, Akira, 4,711,874, Cl. 503-206.000.

Ichinohe, Eisuke: *See—*
Yamaguchi, Seiji; Ichinohe, Eisuke; and Katsura, Johji, 4,712,194, Cl. 365-203.000.

Ida, Shuichiro: *See—*
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.

IDC-Chemie AG: *See—*
Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., 4,711,375, Cl. 222-135.000.

Igarashi, Masahiko: *See—*
Okazaki, Atsushi; Igarashi, Masahiko; and Horie, Tsuneo, 4,712,084, Cl. 338-184.000.

Igarashi, Toshihiko: *See—*
Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, 4,711,433, Cl. 266-222.000.

Igashira, Toshihiko: *See—*
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.

Ihara, Tatsuya: *See—*
Hatano, Masakatsu; Oshima, Kazunori; Ihara, Tatsuya; and Kiyono, Kenichi, 4,711,867, Cl. 502-205.000.

Iida, Hiroyuki; Murakami, Haruhiko; Matsumoto, Tsuyoshi; and Kashihara, Junzo, to Sharp Kabushiki Kaisha. Foldable weighing scale. 4,711,313, Cl. 177-127.000.

Iida, Naohiro, to Nippon Sheet Glass Co., Ltd. Apparatus for shaping glass sheet. 4,711,654, Cl. 65-172.000.

Iino, Tadashi; Nagashima, Yoshikazu; and Sugita, Masaya, to Yazaki Corporation. Display system for vehicle. 4,711,544, Cl. 353-14.000.

Iio, Masaya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 4,712,152, Cl. 361-56.000.

Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Morpholine containing amino acid derivatives. 4,711,958, Cl. 544-139.000.

Iizuka, Kiyoshi, to Canon Kabushiki Kaisha. Display device. 4,711,547, Cl. 354-471.000.

Ijiri, Yasuo: *See—*
Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.

Ikeda, Yoshio, to Kabushiki Kaisha Toshiba. Washing machine. 4,711,104, Cl. 68-23.00R.

Ikekawa, Nobuo. to Taisho Pharmaceutical Co., Ltd. 1α,25-dihydroxy-26,27-dimethylcholecaiciferol and its use in the treatment of calcium pathobolism. 4,711,881, Cl. 514-167.000.

Ikemori, Keiji: *See—*
Matsushita, Takashi; Takahashi, Sadatoshi; Ikemori, Keiji; Kitagishi, Nozomu; Tanaka, Tsunefumi; and Momiyama, Kikuo, 4,711,534, Cl. 350-426.000.

Imada, Kunihiko: *See—*
Nakamatsu, Toshio; Miyamoto, Tetsuya; and Imada, Kunihiko, 4,711,641, Cl. 8-524.000.

Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,711,939, Cl. 526-124.000.

Imai, Masafumi: *See—*
Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,940, Cl. 526-124.000.

Imanishi, Shozo; and Sato, Mitsuo, to Aida Engineering Co., Ltd. Balancing device for press. 4,711,169, Cl. 100-257.000.

Imhoff, Claude: *See—*
d'Humieres, Etienne; Bernet, Jean M.; and Imhoff, Claude, 4,712,001, Cl. 250-213.0VT.

Imperial Chemical Industries PLC: *See—*
Briggs, Malcolm T.; Dowell, Robert I.; and Thornber, Craig W., 4,711,887, Cl. 514-247.000.
Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., 4,711,834, Cl. 430-201.000.
Daniels, James A., 4,711,945, Cl. 528-86.000.

IMRE Corporation: *See—*
Singhal, Anil K., 4,711,839, Cl. 435-4.000.

Inaba, Naomi: *See—*
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.
Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,940, Cl. 526-124.000.

Inagaki, Yoshihiro: *See—*
Takeda, Fumiteru; Hirano, Katsuhiko; and Inagaki, Yoshihiro, 4,711,148, Cl. 84-1.010.

Inagaki, Yoshio; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. 4-amino-2-methyl-3-phenyl-1-(2,4,6-trichlorophenyl)-3-pyrazolin-5-one. 4,711,963, Cl. 548-365.000.

Inoue, Akito. Diaphragm-electrode system for electrocoating. 4,711,709, Cl. 204-282.000.

Inoue, Isao. Ratchet handle. 4,711,145, Cl. 81-177.100.

Inoue, Kichiro: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.

Inoue, Senya; and Ono, Akira, to Kanto Kagaku Kabushiki Kaisha. Calcium-phosphorus-apatite having novel properties and process for preparing the same. 4,711,769, Cl. 423-308.000.

Inoue, Toru: *See—*
Nagasawa, Kiyoshi; Inoue, Toru; and Kashiwazaki, Susumu, 4,712,050, Cl. 318-254.000.

Insley, Margaret Y.; and Kawasaki, Glenn, to ZymoGenetics, Inc. Site specific mutagenesis in alpha-1-antitrypsin. 4,711,848, Cl. 435-91.000.

Instance, David J. Method of making labels. 4,711,686, Cl. 156-227.000.

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Roger, Loic; Maubois, Jean-Louis; Brule, Gerard; and Piot, Michel, 4,711,953, Cl. 530-366.000.

Institut Francais du Petrole: *See—*
Cassou, Jean-Pierre, 4,712,200, Cl. 367-88.000.
Rialan, Joseph; and Bary, Renate, 4,712,199, Cl. 367-76.000.

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Fail, Jean-Pierre, 4,712,198, Cl. 367-23.000.

Instrumentarium Corp.: *See—*
Savelainen, Matti, 4,712,068, Cl. 324-318.000.

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Bhatia, Harsaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., 4,712,125, Cl. 357-59.000.
Fredericks, Kenneth J.; Guerriero, Thomas W.; Miracle, Gerald H.; and Wiegand, Michael R., 4,712.176, Cl. 364-200.000.
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Harder, Christoph S.; Jaeckel, Heinz; and Wolf, Hans P., 4,711,858, Cl. 437-99.000.
Jones, Gardner D., Jr., 4,712,235, Cl. 379-410.000.

Karidis, John P., 4,712,027, Cl. 310-12.000.
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Mintzer, Frederick C.; and Anderson, Karen L., 4,712,140, Cl. 358-260.000.
Nilsson, Ben A.; and Shepard, Roger D., 4,711,552, Cl. 355-3.00R.
Pearce, Harold B.; and West, Lynn P., 4,712,221, Cl. 375-14.000.
Troupes, Demetrios; and Alexander, Randall W., 4,712,102, Cl. 340-790.000.

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McNally, Paul F., 4,712,106, Cl. 340-870.320.

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Luczak, Francis J.; and Landsman, Douglas A., 4,711,829, Cl. 429-44.000.

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Dickinson, Peter D.; and Luciano, Robert A., 4,711,452, Cl. 273-143.00R.

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Alba, Andrew J.; Griesemer, James A.; and Gordon, Robert L., 4,711,389, Cl. 229-1.50B.
Clish, Robert J., 4,711,277, Cl. 141-311.00A.

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Specht, Dieter, 4,711,045, Cl. 40-564.000.

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Horiuchi, Yusuke; and Inui, Masaki, 4,711,135, Cl. 74-473.00R.

Inventio AG: *See*—
Haas, Max, 4,711,323, Cl. 187-52.00R.
Schroder, Joris, 4,711,324, Cl. 187-135.000.

Irako, Koichi, deceased: *See*—
Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased; and Murakamai, Yuichi, 4,711,870, Cl. 502-303.000.

Irako, Sanae, legal heir: *See*—
Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased; and Murakamai, Yuichi, 4,711,870, Cl. 502-303.000.

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Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, 4,711,930, Cl. 502-209.000.

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Gulette, Ronald S.; and Charen, Grace M., 4,711,483, Cl. 296-97.00C.

Irwin, Charles F.; Karpusiewicz, William; and Liberati, Patricia, to Lever Brothers Company. Preparation of bleach catalyst aggregates of manganese cation impregnated aluminosilicates by high velocity granulation. 4,711,748, Cl. 264-117.000.

ISC Cardion Electronics, Inc.: *See*—
Schwab, Carl, 4,712,108, Cl. 342-26.000.

Ishibashi, Tamotu: *See*—
Aso, Toshiyuki; and Ishibashi, Tamotu, 4,711,981, Cl. 219-69.00W.

Ishida, Ryuichi: *See*—
Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, 4,711,878, Cl. 514-18.000.

Ishida Scales Mfg. Co., Ltd.: *See*—
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.

Ishida, Tetsuyoshi; Okiura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, to Babcock-Hitachi Kabushiki Kaisha. Carbon monoxide-oxygen fuel cell. 4,711,828, Cl. 429-12.000.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,711,102, Cl. 68-5.00E.

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Takahashi, Yukio; Hayase, Isao; Amano, Keijirou; Mizukami, Masao; and Ishiguri, Masaaki, 4,711,620, Cl. 418-96.000.

Ishiguro, Yasuo: *See*—
Shiroshita, Osamu; Ishiguro, Yasuo; and Itou, Yoshizumi, 4,712,183, Cl. 364-513.000.

Ishijima, Koji: *See*—
Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, 4,711,617, Cl. 417-295.000.

Ishikawa, Akibumi: *See*—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.

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Udagawa, Tsunekazu, 4,711,456, Cl. 277-235.00B.

Ishizaka, Kazuo: *See*—
Kawakami, Hiroshi; and Ishizaka, Kazuo, 4,712,143, Cl. 358-311.000.

Ishizawa, Yasuhisa: *See*—
Tsunekuni, Masao; and Ishizawa, Yasuhisa, 4,712,100, Cl. 340-710.000.

Iskanderov, Alexandr A.: *See*—
Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.

Isuzu Motors, Ltd.: *See*—
Kawamura, Hideo, 4,711,087, Cl. 60-286.000.

Ito, Michiaki: *See*—
Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, 4,711,105, Cl. 68-23.200.

Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, to Nippon Soken, Inc. Pressure sensor. 4,712,082, Cl. 338-4.000.

Ito, Ssoru, to Diesel Kiki Co., Ltd. Injection start advancer for fuel injection pump assembly of the fuel distribution type. 4,711,205, Cl. 123-179.00L.

Itoh, Isamu: *See*—
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.

Itou, Yoshizumi: *See*—
Shiroshita, Osamu; Ishiguro, Yasuo; and Itou, Yoshizumi, 4,712,183, Cl. 364-513.000.

ITT Corporation: *See*—
Deacon, George R.; and Cranford, William R., 4,711,752, Cl. 264-328.120.

ITT Defense Communications, a Division of ITT Corporation: *See*—
Baker, Anthony P., 4,711,529, Cl. 350-331.00R.

IVO Irion & Vosseler Zahlerfabrik GmbH & Co.: *See*—
Haller, Andreas; Pfundstein, Werner; and Hall, Heinrich, 4,711,991, Cl. 235-132.00E.

Iwaki, Hiroshi: *See*—
Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.

Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Multiple ring armature core for direct current motor. 4,712,034, Cl. 310-217.000.

Iwasawa, Minoru: *See*—
Joyashiki, Hisashi; Iwasawa, Minoru; Oohigashi, Masakazu; and Terai, Masao, 4,710,995, Cl. 15-22.00R.

Iyer, Venkatraman: *See*—
Joshi, Sunil P.; and Iyer, Venkatraman, 4,712,215, Cl. 371-37.000.

Izawa, Kiyosato: *See*—
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, 4,711,977, Cl. 178-18.000.

J & L Associates, Inc.: *See*—
Wolters, Donald R., 4,711,012, Cl. 29-243.520.

Jacobs, Alphonse F.; and Paxton, James R. Temperature and humidity control system. 4,711,294, Cl. 165-19.000.

Jacobson, Stephen E., to BOC Group, Inc., The. Preparation of hydrogen peroxide. 4,711,772, Cl. 423-584.000.

Jacobson, Walter; Riggio, Stephen C.; and Turner, James E., to Akzo N.V. Control for blood gas analyzers and hemoglobin analysis. 4,711,852, Cl. 436-15.000.

Jaeckel, Heinz: *See*—
Harder, Christoph S.; Jaeckel, Heinz; and Wolf, Hans P., 4,711,858, Cl. 437-99.000.

Jamonet, Bernard; Rigouard, Alain; Bouchez, Jean-Pierre; and Duc, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude. Waste water sludge thickener with odor control. 4,711,721, Cl. 210-607.000.

Japan Atomic Energy Research Institute: *See*—
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.

Japan Liquid Crystal Co., Ltd.: *See*—
Shibanai, Ichiro; and Nakamura, Kenji, 4,711,936, Cl. 525-485.000.

Japan Styrene Paper Corporation: *See*—
Kuwabara, Hideki; Naito, Masato; Watanabe, Teishiro; and Hamada, Tadatsugu, 4,711,287, Cl. 165-34.000.

Japan Tobacco, Inc.: *See*—
Katou, Yukio; Suzuki, Takehiro; and Shimada, Susumu, 4,711,316, Cl. 180-168.000.
Nagata, Tomizou; Mutoh, Yoshiyuki; and Kobayashi, Kazutaka, 4,711,339, Cl. 198-419.000.

Jeanjean, Robert; Demissy, Daniel; Saint-Jean, Guy; and Landry, Michel, to Cegelec Industrie Inc. Sulfur hexafluoride circuit-breaker for operating in a very low temperature environment. 4,711,978, Cl. 200-148.00A.

Jen, Kwan-Yue A.; and Elsenbaumer, Ronald L., to Allied Corporation. Solution processible forms of neutral and electrically conductive poly(substituted heterocycles). 4,711,742, Cl. 252-500.000.

Jenekhe, Samson A.; and Hansen, Marcia K., to Honeywell Inc. Electroactive heterocyclic aromatic polymers. 4,711,946, Cl. 528-251.000.

Jenkins, James E. Clothes hanger carrier and storage container. 4,711,383, Cl. 224-202.000.

Jennings, Alfred R., Jr., to Mobil Oil Corporation. Gravel pack void space removal via high energy impulse. 4,711,302, Cl. 166-250.000.

Jenoptik Jena GmbH: *See*—
Quillfeldt, Winfried; Naumann, Bernd; and Becker-Ross, Helmut, 4,711,572, Cl. 356-311.000.

Jetzinger, Franz. Mowing and chopping machine. 4,711,074, Cl. 56-13.600.

Joanna Western Mills Company: *See*—
Chang, A-Shen, 4,711,005, Cl. 29-24.500.

Jochum, Peter, to Hilti Aktiengesellschaft. Explosive powder charge actuated fastening element driving device. 4,711,385, Cl. 227-10.000.

Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,712,088, Cl. 340-347.00P.

Johannes Menschner Maschinenfabrik GmbH & Co. KG: *See*—
Van Dijk, Alfonsius A. J., 4,711,004, Cl. 26-15.00R.

Johansson, Lars A.: *See*—
Wallin, P. O. Thomas; Warell, Bengt H.; Svensson, A. Pedar; Lundstrom, Kurt A.; and Johansson, Lars A., 4,711,184, Cl. 108-144.000.
John O. Butler Company: *See*—
Tarrson, Emanual B.; and Maric, Dane, 4,710,996, Cl. 15-105.000.
Johnson, Clyde T. Locking device. 4,711,106, Cl. 70-34.000.
Johnson, Dennis M.; and Surrency, H. Skeet. Training device for kicking a football or soccer ball. 4,711,043, Cl. 36-139.000.
Johnson, Donald A., to Nalco Chemical Company. Method for prevention of phosphonate decomposition by chlorine. 4,711,724, Cl. 210-699.000.
Johnson, Marvin M.: *See*—
Shyr, Yen-Shin; and Johnson, Marvin M., 4,711,868, Cl. 502-235.000.
Johnson, Van B.; and Nicosia, Salvatore J., to Du Pont de Nemours, E. I., and Company. Daylight x-ray cassette having a weight to improve film release. 4,712,228, Cl. 378-185.000.
Johnson, Walter A.: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,711,660, Cl. 75-0.50B.
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,711,661, Cl. 75-0.50B.
Johnston, H. Fred: *See*—
Wilkinson, Blair E., 4,711,579, Cl. 356-375.000.
Jones, Gardner D., Jr., to International Business Machines Corporation. Method and apparatus for improved control and time sharing of an echo canceller. 4,712,235, Cl. 379-410.000.
Jones, Ralph W. Pawl controlled reel extension. 4,711,409, Cl. 242-107.40R.
Jones, Robert A.: *See*—
Ares, Roland A.; Jones, Robert A.; and Street, Norman E., 4,711,094, Cl. 62-90.000.
Jones, Roger E.: *See*—
Pitt, Gillies D.; Extance, Philip; and Jones, Roger E., 4,712,065, Cl. 324-244.000.
Jordan, Bertram L.: *See*—
Gregory, Charles E., Sr.; Jordan, Bertram L.; and Gregory, Charles E., Jr., 4,711,403, Cl. 241-101.200.
Joseph, Douglas: *See*—
Michels, Dennis; Howe, Geoff; and Joseph, Douglas, 4,712,250, Cl. 455-20.000.
Joshi, Sunil P.; and Iyer, Venkatraman, to Advanced Micro Devices, Inc. CRC calculation machine for separate calculation of checkbits for the header packet and data packet. 4,712,215, Cl. 371-37.000.
Joyashiki, Hisashi; Iwasawa, Minoru; Oohigashi, Masakazu; and Terai, Masao, to Sunstar Kabushiki Kaisha. Electric motor driven toothbrush. 4,710,995, Cl. 15-22.00R.
Judge, John S.: *See*—
Sukonnik, Israil M.; Judge, John S.; and Kilgore, Colin H., 4,711,115, Cl. 72-329.000.
Julstrom, Stephen D., to Shure Brothers, Inc. Teleconference system. 4,712,231, Cl. 379-202.000.
Kabasin, Daniel F., to General Motors Corporation. Acceleration enrichment fuel control. 4,711,218, Cl. 123-492.000.
Kabe, Kazuyuki; Morikawa, Tuneo; and Takahashi, Shuji, to Yokohama Rubber Co., Ltd., The. Pneumatic radial tire for passenger car. 4,711,286, Cl. 152-527.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Konishi, Keiichi, 4,711,358, Cl. 212-178.000.
Kabushiki Kaisha Sato: *See*—
Kikuchi, Hidenori, 4,712,114, Cl. 346-76.0PH.
Kabushiki Kaisha Takara: *See*—
Tsuda, Masaaki, 4,711,064, Cl. 53-137.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Mori, Shinji, 4,711,408, Cl. 242-107.000.
Kabushiki Kaisha Toshiba: *See*—
Abuyama, Yasuo, 4,711,556, Cl. 355-14.00R.
Aoki, Hiroyuki, 4,712,185, Cl. 364-518.000.
Ikeda, Yoshio, 4,711,104, Cl. 68-23.00R.
Kamasaki, Keiji, 4,712,017, Cl. 250-551.000.
Kikuchi, Katsuya, 4,712,133, Cl. 358-98.000.
Nishimura, Eiji; Takigawa, Tadahiro; and Kato, Yoshihide, 4,712,013, Cl. 250-492.200.
Niwa, Kiyomi; and Kozawa, Yutaka, 4,711,293, Cl. 165-4.000.
Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, 4,711,105, Cl. 68-23.200.
Sambayashi, Takeshi, 4,711,559, Cl. 355-14.00D.
Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,712,038, Cl. 313-2.100.
Takenaka, Shigeo; and Kamohara, Eiji, 4,712,043, Cl. 315-15.000.
Tanabe, Toshiyuki, 4,712,131, Cl. 358-142.000.
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.
Toshimitsu, Kenshi; and Kohayakawa, Hiromasa, 4,711,555, Cl. 355-14.00R.
Watanabe, Junji, 4,711,553, Cl. 355-4.000.
Watanabe, Junji, 4,711,557, Cl. 355-14.00R.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Shiroshita, Osamu; Ishiguro, Yasuo; and Itou, Yoshizumi, 4,712,183, Cl. 364-513.000.
Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., to Xerox Corporation. High density CCD imager. 4,712,137, Cl. 358-213.290.
Kadunce, Leo, to Steeltin Can Corporation. Method and machine for convolute or spiral winding of composite materials. 4,711,801, Cl. 428-192.000.
Kagi, Bruno, to Strapex AG. Apparatus to strap a tape around an object. 4,711,071, Cl. 53-589.000.
Kaisei Kogyo Corporation: *See*—
Fuminao, Tanitomi, 4,711,278, Cl. 144-2.00Z.
Kaiser, June. Protective sanitary barrier for CPR doll. 4,711,237, Cl. 128-136.000.
Kaiser, Robert. Method and apparatus for removal of small particles from a surface. 4,711,256, Cl. 134-25.400.
Kajita, Hiroshi: *See*—
Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, 4,711,550, Cl. 355-3.0SH.
Kakita, Yukio: *See*—
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.
Kakizawa, Koichiro: *See*—
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,711,542, Cl. 351-221.000.
Kakizawa, Toshio: *See*—
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.
Kal, Stephen: *See*—
Saint Ive, Michael H., 4,711,453, Cl. 273-268.000.
Kalkbrenner, Ralph W.: *See*—
Kobuck, Richard M.; and Kalkbrenner, Ralph W., 4,711,436, Cl. 269-40.000.
Kalmijn, Hilco T.: *See*—
Kemner, Rudolf; and Kalmijn, Hilco T., 4,712,069, Cl. 324-322.000.
Kamasaki, Keiji, to Kabushiki Kaisha Toshiba. Photocoupler device having reflecting surface enhance signal transmission. 4,712,017, Cl. 250-551.000.
Kamijo, Tetsuhide: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.
Kamohara, Eiji: *See*—
Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,712,038, Cl. 313-2.100.
Takenaka, Shigeo; and Kamohara, Eiji, 4,712,043, Cl. 315-15.000.
Kanaiwa, Kiyoshi: *See*—
Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, 4,712,118, Cl. 346-108.000.
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, to Nippon Kokan Kabushiki Kaisha; and Yushiro Chemical Industry Co., Ltd. Lubricant for the production of seamless tubes. 4,711,733, Cl. 252-29.000.
Kanda, Shigeto, to Canon Kabushiki Kaisha. Tracking error signal detecting device with a two-beam system for use in an optical information memory. 4,712,206, Cl. 369-46.000.
Kandathil, Thomas V., to S. C. Johnson & Son, Inc. Enzyme prespotter composition stabilized with water insoluble polyester or polyether polyol. 4,711,739, Cl. 252-139.000.
Kando, Akiyoshi: *See*—
Watanabe, Kozo; Kando, Akiyoshi; and Horita, Yoshiyuki, 4,711,020, Cl. 29-767.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,711,807, Cl. 428-334.000.
Kaneiwa, Shinji: *See*—
Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,712,219, Cl. 372-45.000.
Kaneko, Takashi: *See*—
Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.
Kanemori, Kaoru: *See*—
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamure, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.
Kaneshiro, Tsuneo, to United States of America, Agriculture. Enhancement of nitrogen-fixation with rhizobial tan variants. 4,711,656, Cl. 71-7.000.
Kannan, Krishnamurthi: *See*—
Meltzer, Clifford B.; Kannan, Krishnamurthi; Burket, Thomas G.; Kruesi, Deborah J.; and Braudaway, Gordon W., 4,712,214, Cl. 371-32.000.
Kano, Hidekazu; Shinchi, Takashi; and Hosoi, Shuichi, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for internal combustion engines at low temperature. 4,711,217, Cl. 123-491.000.
Kano, Mitsuru: *See*—
Nakanowatari, Jun; and Kano, Mitsuru, 4,711,530, Cl. 350-339.00R.
Kanoh, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, to Morikawa Sangyo Kabushiki Kaisha. Casting method and apparatus. 4,711,289, Cl. 164-34.000.
Kanto Kagaku Kabushiki Kaisha: *See*—
Inoue, Senya; and Ono, Akira, 4,711,769, Cl. 423-308.000.
Kao Corporation: *See*—
Suzuki, Toshio; and Yahagi, Kazuyuki, 4,711,776, Cl. 424-70.000.
Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. Thiazine and thiazepine containing compounds. 4,711,884, Cl. 514-226.000.
Karidis, John P., to International Business Machines Corporation. Radial pole linear reluctance motor. 4,712,027, Cl. 310-12.000.

Karpusiewicz, William: *See*—
Irwin, Charles F.; Karpusiewicz, William; and Liberati, Patricia, 4,711,748, Cl. 264-117.000.
Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri ; and Rovensky, Jozef, to SPOFA, spojene podniky pro zdravotnick-ouvyrobu. Serum thymic factor peptide analogs and process for the preparation thereof. 4,711,952, Cl. 530-327.000.
Kashihara, Junzo: *See*—
Iida, Hiroyuki; Murakami, Haruhiko; Matsumoto, Tsuyoshi; and Kashihara, Junzo, 4,711,313, Cl. 177-127.000.
Kashiwazaki, Susumu: *See*—
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Kataoka, Hironori: *See*—
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Kato, Junichi: *See*—
Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Syunichiro; and Ouchi, Hiromu, 4,711,862, Cl. 501-136.000.
Kato, Shinichi: *See*—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.
Kato, Takatsugu; and Takahashi, Takao, to Nissan Motor Co., Ltd. Loom. 4,711,273, Cl. 139-116.000.
Kato, Toshinobu: *See*—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
Kato Tsuyoshi: *See*—
Saito, Atsushi; Ojima, Masahiro; Maeda, Takeshi; and Kato Tsuyoshi, 4,712,203, Cl. 369-13.000.
Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, to Babcock-Hitachi Kabushiki Kaisha. Catalyst for combustion and process for producing same. 4,711,872, Cl. 502-328.000.
Kato, Yoshiaki, to Canon Kabushiki Kaisha. Image communication apparatus. 4,712,139, Cl. 358-257.000.
Kato, Yoshihide: *See*—
Nishimura, Eiji; Takigawa, Tadahiro; and Kato, Yoshihide, 4,712,013, Cl. 250-492.200.
Katou, Akito, to Matsushita Electric Industrial Co., Ltd. Deflecting yoke. 4,712,080, Cl. 335-213.000.
Katou, Yukio; Suzuki, Takehiro; and Shimada, Susumu, to Japan Tobacco, Inc. Guidance system for unmanned transporting vehicle. 4,711,316, Cl. 180-168.000.
Katsumi, Hideo: *See*—
Kikuchi, Shunichi; Matsunaga, Haruyuki; Katsumi, Hideo; and Katsuyama, Koji, 4,712,158, Cl. 361-385.000.
Katsura, Johji: *See*—
Yamaguchi, Seiji; Ichinohe, Eisuke; and Katsura, Johji, 4,712,194, Cl. 365-203.000.
Katsuyama, Koji: *See*—
Kikuchi, Shunichi; Matsunaga, Haruyuki; Katsumi, Hideo; and Katsuyama, Koji, 4,712,158, Cl. 361-385.000.
Kaukler, William F., to United States of America, National Aeronautics and Space Administration. Method for investigating the formation of crystals in a transparent material. 4,711,697, Cl. 156-621.000.
Kawaguchi, Fumiaki; Shimazu, Toshikazu; and Takahashi, Kazuhisa, to Canon Kabushiki Kaisha. Adjusting apparatus for laser scanning system with acousto-optical element. 4,712,117, Cl. 346-108.000.
Kawahara, Nobuaki: *See*—
Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, 4,711,990, Cl. 219-552.000.
Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for preventing the rise of oil in a stirling engine. 4,711,091, Cl. 60-517.000.
Kawakami, Hiroshi; and Ishizaka, Kazuo, to Sony Corporation. Apparatus for monitoring a timebase compressed color video signal. 4,712,143, Cl. 358-311.000.
Kawakita, Tetsuya: *See*—
Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.
Kawamura, Hideo, to Isuzu Motors, Ltd. Emissions filter regeneration system. 4,711,087, Cl. 60-286.000.
Kawamura, Masunori: *See*—
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,711,542, Cl. 351-221.000.
Kawanabe, Tetsuya, to Canon Kabushiki Kaisha. Timer apparatus. 4,712,072, Cl. 328-130.100.
Kawanishi, Toshiyuki: *See*—
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.
Kawasaki, Glenn: *See*—
Insley, Margaret Y.; and Kawasaki, Glenn, 4,711,848, Cl. 435-91.000.
Kawashima, Syunichiro: *See*—
Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Syunichiro; and Ouchi, Hiromu, 4,711,862, Cl. 501-136.000.
Kayata, Haruhiko: *See*—
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.
Kayser, John P.: *See*—
Dombroski, Robert M.; and Kayser, John P., 4,711,320, Cl. 184-3.200.
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., to General Motors Corporation. Actuator for converting linear motion to rotary motion and vice versa. 4,711,156, Cl. 92-31.000.
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., to General Motors Corporation. Actuator for converting linear motion to rotary motion and vice versa. 4,711,157, Cl. 92-31.000.
Kayyod, Fariborz; and Hoffman, Donald E., to General Motors Corporation. Linear motion actuator with spring centering means. 4,711,158, Cl. 92-94.000.
Kazaoka, Kenichi; Wakamatsu, Fumio; and Shinkai, Yasuo, to Aisin Seiki Kabushika Kaisha. Seat for vehicles. 4,711,497, Cl. 297-458.000.
Kehr, Wolfgang: *See*—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
Keizer, Klass: *See*—
Leenaars, Adriaan F. M.; Burggraaf, Anthonie J.; and Keizer, Klass, 4,711,719, Cl. 210-500.260.
Kelly, William J.: *See*—
Glasser, George M.; DeRobertis, Robert P.; Smithwrick, John H.; and Kelly, William J., 4,711,979, Cl. 219-10.55D.
Kemner, Rudolf; and Kalmijn, Hilco T., to U.S. Philips Corporation. Magnetic resonance imaging apparatus including two orthogonal r.f. coils. 4,712,069, Cl. 324-322.000.
Kemp, Paul C.; and Lyons, Walter, to Ashland Oil, Inc. Stabilized coal oil mixtures. 4,711,643, Cl. 44-51.000.
Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation. Spherical precious metal based powder particles and process for producing same. 4,711,660, Cl. 75-0.50B.
Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation. Spherical copper based powder particles and process for producing same. 4,711,661, Cl. 75-0.50B.
Kennametal Inc.: *See*—
Yeckley, Russel L.; and North, Bernard, 4,711,644, Cl. 51-307.000.
Kennecott Corporation: *See*—
Nunlist, Erwin J., 4,711,296, Cl. 165-47.000.
Kennedy, John F.: *See*—
Odgaard, A. Jacob; and Kennedy, John F., 4,711,597, Cl. 405-25.000.
Kennedy, Richard B. Rotary mixing of two component resins in disposable plastic bag. 4,711,582, Cl. 366-279.000.
Keogh, Raymond J.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
Kersten, Peter: *See*—
Heck, Wolfgang; Kersten, Peter; and Volz, Hans, 4,712,083, Cl. 338-32.00R.
Kessel, Erwin: *See*—
Kessel, Michael; Kessel, Erwin; and Schneider, Eugene, 4,711,281, Cl. 144-256.100.
Kessel, Michael; Kessel, Erwin; and Schneider, Eugene. Curved wood bending machine. 4,711,281, Cl. 144-256.100.
Keystone International, Inc.: *See*—
Holtgraver, Edward G., 4,711,427, Cl. 251-308.000.
Kidouchi, Yasuo; and Yonekubo, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Mixing valve apparatus. 4,711,392, Cl. 236-12.120.
Kikuchi, Hidenori, to Kabushiki Kaisha Sato. Label feeding apparatus for a thermal label printer. 4,712,114, Cl. 346-76.0PH.
Kikuchi, Kaoru; and Shikata, Nobuo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for removal of scale from hot rolled steel. 4,711,707, Cl. 204-145.00R.
Kikuchi, Katsuya, to Kabushiki Kaisha Toshiba. Endoscopic apparatus. 4,712,133, Cl. 358-98.000.
Kikuchi, Kazuhiko; Honguu, Kazuoki; and Sawamura, Mitsuharu, to Canon Kabushiki Kaisha. Opto-magnetic recording medium. 4,711,821, Cl. 428-457.000.
Kikuchi, Shunichi; Matsunaga, Haruyuki; Katsumi, Hideo; and Katsuyama, Koji, to Fujitsu Limited. Cooling system for electronic circuit components. 4,712,158, Cl. 361-385.000.
Kilby, J. F.: *See*—
Rossborough, Richard F.; and Whitty, Graeme, 4,711,258, Cl. 134-138.000.
Kilgore, Colin H.: *See*—
Sukonnik, Israil M.; Judge, John S.; and Kilgore, Colin H., 4,711,115, Cl. 72-329.000.
Kimura, Akihiro: *See*—
Ando, Toshio; Nishihara, Toshikazu; and Kimura, Akihiro, 4,711,810, Cl. 428-336.000.
Kimura, Mituo: *See*—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.
Kimura, Shigeru: *See*—
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
King, Norman R.: *See*—
Carleton, Samuel A.; and King, Norman R., 4,712,040, Cl. 313-331.000.
Kinglor-Ltd: *See*—
Ferrari, Lorenzo, 4,711,663, Cl. 75-53.000.

Kinoshita, Takao: *See*—
Hashimoto, Seiji; Kinoshita, Takao; and Tanaka, Nobuyoshi, 4,712,135, Cl. 358-213.220.

Kinoshita, Yoshiaki, to Toyota Jidosha Kabushiki Kaisha. Automotive-engine fuel supply system. 4,711,200, Cl. 123-492.000.

Kishida, Hiroo; and Takenaka, Hirofumi, to Harumoto Iron Works Co., Ltd. Method of forming a composite structural member. 4,710,994, Cl. 14-1.000.

Kiso, Yoshiaki: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.

Kissei Pharmaceutical Co., Ltd.: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.

Kit, Malon; and Kit, Saul, to NovaGene, Inc.; and Baylor College of Medicine. Pseudorabies virus mutants, vaccines containing same, methods for the production of same and methods for the use of same. 4,711,850, Cl. 435-235.000.

Kit, Saul: *See*—
Kit, Malon; and Kit, Saul, 4,711,850, Cl. 435-235.000.

Kita, Toru, to Nissan Motor Co., Ltd. Torque detector. 4,711,134, Cl. 73-862.360.

Kitade, Nobumitsu, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a transfer clutch of a four-wheel drive vehicle. 4,711,318, Cl. 180-247.000.

Kitagawa, Tohru: *See*—
Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, 4,711,314, Cl. 177-164.000.

Kitagishi, Nozomu: *See*—
Matsushita, Takashi; Takahashi, Sadatoshi; Ikemori, Keiji; Kitagishi, Nozomu; Tanaka, Tsunefumi; and Momiyama, Kikuo, 4,711,534, Cl. 350-426.000.

Kitamura, Tomimasa, to Koyo Auto-Mech Co., Ltd. Vehicle car steering system. 4,711,315, Cl. 180-132.000.

Kitaori, Tadahiro; Haginoya, Tsutomu; and Kozakura, Nobuto, to Tsubakimoto Chain Company. Carburized pin for chain. 4,711,676, Cl. 148-319.000.

Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Recording apparatus having plural adjustable recording heads. 4,712,119, Cl. 346-140.00R.

Kiyohara, Takehiko; Terasawa, Koji; and Miyakawa, Akira, to Canon Kabushiki Kaisha. Method for preventing non-discharge in a liquid jet recorder and a liquid jet recorder. 4,712,172, Cl. 346-1.100.

Kiyono, Kenichi: *See*—
Hatano, Masakatsu; Oshima, Kazunori; Ihara, Tatsuya; and Kiyono, Kenichi, 4,711,867, Cl. 502-205.000.

Kizawa, Hiroyuki, to Seikosha Co., Ltd. Clock. 4,711,586, Cl. 368-232.000.

KJS Industries, Inc.: *See*—
Bennett, Robert, 4,711,354, Cl. 206-385.000.

Klaase, Theodorus A.: *See*—
Verbeek, Pieter W.; Klaase, Theodorus A.; and Theil, Arne, 4,712,037, Cl. 310-323.000.

Klaassen, Klaas B., to International Business Machines Corporation. Method and apparatus for reading recorded data by a magnetoresistive head. 4,712,144, Cl. 360-67.000.

Klat, Samir R.: *See*—
Knight, Robert G.; Klat, Samir R.; and Unwin, Kenneth, 4,711,309, Cl. 175-93.000.

Klauke, Erich: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,711,905, Cl. 514-522.000.

Kleinschroth, Jurgen: *See*—
Satzinger, Gerhard; Hartenstein, Johannes; Mannhardt, Karl; Kleinschroth, Jurgen; Oswald, Hartmut; Weinheimer, Gunter; and Fritschi, Edgar, 4,711,901, Cl. 514-300.000.

Kleman, Thomas G.: *See*—
Herrington, Richard A.; Kleman, Thomas G.; and Apolinar, Ermelinda A., 4,711,056, Cl. 51-410.000.

Klier, Richard G.: *See*—
Brown, Reed S.; Consoli, John J.; and Klier, Richard G., 4,712,236, Cl. 379-433.000.

Klockner-Humboldt-Deutz AG: *See*—
Schaible, Siegfried; Hohlwegler, Heinz; and Kohl, Bernhard, 4,711,078, Cl. 56-341.000.

Klockner, Jurgen: *See*—
Rohde, Wolfgang; and Klockner, Jurgen, 4,711,109, Cl. 72-8.000.

Kloeckner-Humboldt-Deutz AG: *See*—
Schmittbetz, Klaus, 4,711,460, Cl. 280-460.00A.

Klosterhalfen, Hartwig: *See*—
Lung, Dieter; Kluft, Werner; Fabry, Jochen; Wittkopp, Helmut; Dombrowski, Theodor; and Klosterhalfen, Hartwig, 4,711,146, Cl. 82-1.00C.

Kluft, Werner: *See*—
Lung, Dieter; Kluft, Werner; Fabry, Jochen; Wittkopp, Helmut; Dombrowski, Theodor; and Klosterhalfen, Hartwig, 4,711,146, Cl. 82-1.00C.

Kluth, Joachim; Muller, Klaus-Helmut; and Pfister, Theodor, to Bayer Aktiengesellschaft. 2-cyanoamino-pyrimidines. 4,711,959, Cl. 544-320.000.

Knable, Joseph J.; Ferdelman, Donald C.; and Bojanowski, Gerald M., to General Motors Corporation. Vehicle suspension strut and upper mount assembly therefor. 4,711,463, Cl. 280-668.000.

Knape & Vogt Manufacturing Company: *See*—
Clement, Gene R., 4,711,588, Cl. 384-18.000.

Knauer, Joachim F.; and Freimuth, Martin, to Knauer, Joachim F. Nozzle cartridge for injection molding. 4,711,625, Cl. 425-549.000.

Kneller, James F.: *See*—
Pierce, Claudia C.; Robinson, Robert S.; and Kneller, James F., 4,711,726, Cl. 210-701.000.

Kness, Lester E., to Kness Manufacturing Co., Inc. Animal trap. 4,711,049, Cl. 43-81.000.

Kness Manufacturing Co., Inc.: *See*—
Kness, Lester E., 4,711,049, Cl. 43-81.000.

Knight, Robert G.; Klat, Samir R.; and Unwin, Kenneth, to Nytol Enterprises Limited. Drilling apparatus. 4,711,309, Cl. 175-93.000.

Knight, Rodney A.: *See*—
Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., 4,711,793, Cl. 427-244.000.

Kobayashi, Kazutaka: *See*—
Nagata, Tomizou; Mutoh, Yoshiyuki; and Kobayashi, Kazutaka, 4,711,339, Cl. 198-419.000.

Kobayashi, Masahiko, to Kuron Kabushiki Kaisha. Remote control blind system. 4,712,104, Cl. 340-825.520.

Kobayashi, Minoru, to Nisshin Seiki Kabushiki Kaisha. Vehicle washing apparatus. 4,711,257, Cl. 134-56.00R.

Kobayashi, Ryohei: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,711,675, Cl. 148-144.000.

Kobuck, Richard M.; and Kalkbrenner, Ralph W., to Westinghouse Electric Corp. Grid assembly fixture, retention strap and method. 4,711,436, Cl. 269-40.000.

Kobylecki, Ryszard J.: *See*—
Campbell, Simon F.; and Kobylecki, Ryszard J., 4,711,882, Cl. 514-228.000.

Koch, Carl C.: *See*—
Liu, Chain T.; and Koch, Carl C., 4,711,761, Cl. 420-459.000.

Kocis, Petr: *See*—
Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri ; and Rovensky, Jozef, 4,711,952, Cl. 530-327.000.

Koeling, Thijs; Lehr, Bernd C.; and Broekhuizen, Willem, to Shell Oil Company. Method and means for determining the subsurface position of a blowing well with respect to a relief well. 4,711,303, Cl. 166-250.000.

Koerner, Norman D.: *See*—
Brooks, Royce L., 4,711,487, Cl. 297-183.000.

Kohayakawa, Hiromasa: *See*—
Toshimitsu, Kenshi; and Kohayakawa, Hiromasa, 4,711,555, Cl. 355-14.00R.

Kohl, Bernhard: *See*—
Schaible, Siegfried; Hohlwegler, Heinz; and Kohl, Bernhard, 4,711,078, Cl. 56-341.000.

Kohler Co.: *See*—
Mesun, Randy O.; and Schobert, Frank, 4,710,987, Cl. 4-420.000.

Kohler, Hans E. P., to U.S. Philips Corporation. Remote control hand apparatus for operating different modules. 4,712,105, Cl. 340-825.690.

Koike, Kazuyoshi: *See*—
Tahara, Yasuteru; and Koike, Kazuyoshi, 4,711,121, Cl. 73-37.700.

Koizumi, Hiroshi, to Mitutoyo Mfg. Co., Ltd. Electronic measuring device. 4,711,034, Cl. 33-172.00E.

Kojima, Masaki; and Munekata, Seiji, to Honny Chemicals Company Ltd.; and Asahi Glass Company Ltd. Composition for electrodeposition paint. 4,711,926, Cl. 524-512.000.

Koka, Narasimharao: *See*—
Tuy, Heang K.; and Koka, Narasimharao, 4,712,178, Cl. 364-414.000.

Kokta, Milan R., to Union Carbide Corporation. Process for enhancing $Ti:Al_2O_3$ tunable laser crystal fluorescence by controlling crystal growth atmosphere. 4,711,696, Cl. 156-617.0SP.

Kolakowski, Manfred: *See*—
Rohde, Wolfgang; and Kolakowski, Manfred, 4,711,114, Cl. 72-234.000.

Kolbenschmidt AG: *See*—
Sander, Wilfried; and Mielke, Siegfried, 4,711,208, Cl. 123-271.000.

Koleske, Joseph V.: *See*—
Sherwin, Maynard A.; and Koleske, Joseph V., 4,711,944, Cl. 526-318.420.

Kolling, Rudi: *See*—
Breher, Rudolf; and Kolling, Rudi, 4,711,346, Cl. 198-844.000.

Kollmorgen Technologies Corporation: *See*—
Savla, Lalit J., 4,712,005, Cl. 250-231.0SE.
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.

Komatsuzaki, Takeshi: *See*—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.

Kondo, Shigeo: *See*—
Yoshiike, Nobuyuki; and Kondo, Shigeo, 4,711,815, Cl. 428-411.100.

Kondratiev, Igor F.: *See*—
Sorochenko, Oleg A.; and Kondratiev, Igor F., 4,711,239, Cl. 128-303.140.

Konig, Wolfgang; Engels, Joachim; Uhlmann, Eugen; and Wetekam, Waldemar, to 501 Hoechst Aktiengesellschaft. Preparation of secretin. 4,711,847, Cl. 435-70.000.

Konishi, Keiichi, to Kabushiki Kaisha Kobe Seiko Sho. Counterbalancing type crane. 4,711,358, Cl. 212-178.000.

Konishi, Kunihiko: *See*—
Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, 4,711,872, Cl. 502-328.000.

Konkol, Werner; Bahrmann, Helmut; Dambkes, Georg; Gick, Wilhelm; Wiebus, Ernst; and Bach, Hanswilhelm, to Ruhrechemie Aktiengesellschaft. Process for purification of gases. 4,711,648, Cl. 55-73.000.

Kono, Hiroshi: *See*—
Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, 4,711,433, Cl. 266-222.0.?.

Kono, Tatsuhiko: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.

Kooy, Wayne J. Rudder assembly. 4,711,192, Cl. 114-162.000.

Korcz, William H.; and Singhal, Surendra N., to Shell Oil Company. Modified end cap for thermoplastic container. 4,711,362, Cl. 220-67.000.

Kosaka, Takao; Okumura, Fumio; and Tsukahara, Hirokazu, to Mitsubishi Paper Mills, Ltd. Process for producing microcapsules. 4,711,749, Cl. 264-4.700.

Kosaka, Yoshio: *See*—
Sawamura, Kentaro; Kosaka, Yoshio; and Yamaguchi, Masayasu, 4,711,861, Cl. 501-98.000.

Koschier, Friedlieb: *See*—
Peppmoller, Reinmar; and Koschier, Friedlieb, 4,711,919, Cl. 524-77.000.

Kosednar, Joseph F.; and Barth, Merlyn W. Fraud-resistant manual magnetic reader-writer system for debit card use. 4,711,993, Cl. 235-380.000.

Kotok, Alan: *See*—
Guglielmi, Paul M.; Melanson, Ronald J.; and Kotok, Alan, 4,712,190, Cl. 364-900.000.

Kouchiwa, Taira, to Ricoh Company, Ltd. Color separating lens composed of three lens units. 4,711,536, Cl. 350-476.000.

Koudele, Larry J.: *See*—
Cronch, Robert D.; and Koudele, Larry J., 4,712,076, Cl. 331-16.000.

Kowa Company Ltd.: *See*—
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,711,542, Cl. 351-221.000.

Koyo Auto-Mech Co., Ltd.: *See*—
Kitamura, Tomimasa, 4,711,315, Cl. 180-132.000.

Kozakura, Nobuto: *See*—
Kitaori, Tadahiro; Haginoya, Tsutomu; and Kozakura, Nobuto, 4,711,676, Cl. 148-319.000.

Kozawa, Yutaka: *See*—
Niwa, Kiyomi; and Kozawa, Yutaka, 4,711,293, Cl. 165-4.000.

Krage, William G.; Stephens, Barry D.; and Denman, Owen S., to Energy Absorption Systems, Inc. Vehicle impact attenuating device. 4,711,481, Cl. 293-133.000.

Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Substituted triazolylmethyl tert.-butyl ketone compounds and plant protection agents. 4,711,657, Cl. 71-92.000.

Kramer, Wolfgang: *See*—
Fischer, Artur; and Kramer, Wolfgang, 4,711,232, Cl. 128-92.0YF.

Krantz, Herman F. Leak detection and refrigerant purging system. 4,711,096, Cl. 62-129.000.

Krause, Hugh A. Child seat assembly for wheelchair. 4,711,489, Cl. 297-243.000.

Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Bag tie with press release lever. 4,711,002, Cl. 24-30.50P.

Krendeleva, Alisa I.: *See*—
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.

Krepelka, Jiri : *See*—
Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri ; and Rovensky, Jozef, 4,711,952, Cl. 530-327.000.

Kroener, Michael: *See*—
Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, 4,711,930, Cl. 502-209.000.

Kronvall, Hans C. G., to Pharmacia Aktiebolaget. Method for determining one or more antigens in a sample. 4,711,841, Cl. 435-7.000.

Kruesi, Deborah J.: *See*—
Meltzer, Clifford B.; Kannan, Krishnamurthi; Burket, Thomas G.; Kruesi, Deborah J.; and Braudaway, Gordon W., 4,712,214, Cl. 371-32.000.

Krusas, James J.; and Pienta, Joseph J., to American Optical Corporation. Support structure for protective mask optical insert. 4,711,539, Cl. 351-63.000.

Kryos Energy Inc.: *See*—
Markbreiter, Stephen J.; and Dessanti, Daniel J., 4,711,093, Cl. 62-87.000.

Kubitza, Werner; and Mennicken, Gerhard, to Bayer Aktiengesellschaft. Use of polyisocyanates or polyisocyanate mixtures as additives for aqueous emulsion paints. 4,711,918, Cl. 524-196.000.

Kubo, Kenji: *See*—
Omae, Tsutomu; Obara, Sanshiro; Kubo, Kenji; and Watanabe, Masahiko, 4,712,052, Cl. 318-625.000.

Kubota, Koji: *See*—
Yokozeki, Kenzo; and Kubota, Koji, 4,711,846, Cl. 435-70.000.

Kubota, Ltd.: *See*—
Hasegawa, Shigekazu; Machida, Satoshi; and Oota, Yoshimi, 4,711,329, Cl. 192-3.570.

Kubota, Tetsuhiro: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.

Kudo, Takabumi: *See*—
Ogawa, Masaki; and Kudo, Takabumi, 4,711,285, Cl. 152-458.000.

Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., to Morton Thiokol, Inc. Stabilizers for halogen-containing polymers comprising the product of a diorganotin oxide, an ethylenically unsaturated dicarboxylic acid ester and a mercaptan. 4,711,920, Cl. 524-178.000.

Kuijpers, Eugene G. M.: *See*—
Mesters, Carolus M. A. M.; Geus, John W.; and Kuijpers, Eugene G. M., 4,711,773, Cl. 423-655.000.

Kumanoya, Masaki: *See*—
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.

Kumar, Ravi, to Air Products and Chemicals, Inc. Removal of water and carbon dioxide from atmospheric air. 4,711,645, Cl. 55-26.000.

Kuntz, Irving, to Exxon Chemical Patents Inc. Adamantane polymerization catalyst. 4,711,866, Cl. 502-152.000.

Kuo, Charles C. Y., to CTS Corporation. Megohm resistor paint and resistors made therefrom. 4,711,803, Cl. 428-209.000.

Kuo, James R., to Fairchild Camera & Instrument Corp. Monolithic telephone subscriber line interface circuit. 4,712,233, Cl. 379-386.000.

Kurimoto, Mamoru: *See*—
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,711,675, Cl. 148-144.000.

Kuritani, Kazushige; and Nakagawa, Tatsuhiko, to NEC Corporation. Monitoring apparatus capable of monitoring a digital equipment by the use of a synchronization signal. 4,712,209, Cl. 370-13.000.

Kuroda, Masato: *See*—
Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, 4,712,173, Cl. 364-138.000.

Kuron Kabushiki Kaisha: *See*—
Kobayashi, Masahiko, 4,712,104, Cl. 340-825.520.

Kurosawa, Kazuyuki: *See*—
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, 4,712,243, Cl. 381-43.000.

Kurozumi, Seizi: *See*—
Hazato, Atsuo; Sugiura, Satsohi; Kurozumi, Seizi; and Noyori, Ryoji, 4,711,895, Cl. 514-530.000.

Kurusu, Yasuo: *See*—
Tomohisa, Kunio; Cho, Masamichi; and Kurusu, Yasuo, 4,712,141, Cl. 358-280.000.

Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, to Honda Giken Kogyo Kabushiki Kaisha. Cutter housing for power-driven lawn mower. 4,711,077, Cl. 56-320.200.

Kuusento, Jaakko: *See*—
Hartiala, Eero; Kuusento, Jaakko; and Paasonen, Hannu, 4,711,090, Cl. 60-422.000.

Kuwabara, Hideki; Naito, Masato; Watanabe, Teishiro; and Hamada, Tadatsugu, to Mitsubishi Jukogyo Kabushiki Kaisha; and Japan Styrene Paper Corporation. Casting method. 4,711,287, Cl. 165-34.000.

Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamure, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, to Sanyo Electric Co., Ltd. Refrigerator. 4,711,098, Cl. 62-441.000.

Kuwae, Yoko: *See*—
Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, 4,711,830, Cl. 430-52.000.

Kuzara, David J., to American Cyanamid Company. Digital moisture dermatometer. 4,711,244, Cl. 128-632.000.

Kwauka, Gerd-Georg, to Mohndruck Graphische Betriebe GmbH. Palleting device. 4,711,612, Cl. 414-68.000.

Kwon, Young J.; and Schulte, Susan M., to Westinghouse Electric Corp. Process for producing zirconium sponge with a very low iron content. 4,711,664, Cl. 75-84.500.

Kwun, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., to Association of American Railroads. Method of wear monitoring using ultrasonic phase comparison. 4,711,120, Cl. 73-119.00R.

Kyuma, Kenji; and Hieda, Teruo, to Canon Kabushiki Kaisha. Low-noise apparatus for image pickup and combination of light and electric signals. 4,712,138, Cl. 358-213.310.

Labofina, S.A.: *See*—
Remacle, Roger E. M.; and Verbeeck, Alain A. J., 4,711,728, Cl. 210-772.000.

Labrum, Joseph H., to Sperry Corporation. Broadband optical processor for determination of frequency and time of arrival of multiple signals. 4,712,059, Cl. 324-77.00K.

Lach, Lawrence E., to Gould Inc. Small propagation delay measurement for digital logic. 4,712,061, Cl. 324-83.00D.

Lade, Jan: *See*—
Asbjornsen, Svein; and Lade, Jan, 4,711,492, Cl. 297-284.000.

Laggan Marine Developments Limited: *See*—
Wilks, Thomas M., 4,711,196, Cl. 114-365.000.

Lagier, Michel, to Thomson CSF. Acoustic self-guidance systems for submarine vehicles. 4,712,201, Cl. 367-92.000.

Lahiff, John E., to Essex Group, Inc. Electromagnetic fuel injector having continuous flow path. 4,711,397, Cl. 239-125.000.

Lahoda, Edward J.: *See*—
Peterson, Steven H.; Lahoda, Edward J.; and Weisberg, Sharon L., 4,711,768, Cl. 423-21.500.

Lai, George Y., to Cabot Corporation. Sulfidation-resistant Co-Cr-Ni alloy with critical contents of silicon and cobalt. 4,711,763, Cl. 420-585.000.

Lai, John T., to B. F. Goodrich Company, The. Synthesis of 2-keto-1,4-diazacycloalkanes. 4,711,957, Cl. 544-231.000.

Laing, John, to Tapeimp Limited. Inertia sensitive device. 4,712,098, Cl. 340-669.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes George Claude: *See*—
Jamonet, Bernard; Rigouard, Alain; Bouchez, Jean-Pierre; and Duc, Jean, 4,711,721, Cl. 210-607.000.

Laitram Corporation, The: *See*—
Fowler, John T., 4,711,194, Cl. 114-245.000.

Lakin, Bryan L., to Fasco Industries, Inc. Self-aligning bearing and oil cap mount for an electric motor. 4,711,590, Cl. 384-206.000.

Lakin, Bryan L.; and Wharton McDaniel, William P., to Fasco Industires, Inc. Heat sink and mounting arrangement therefor. 4,712,030, Cl. 310-89.000.

Lakso, Matthew L. Locking system. 4,711,505, Cl. 312-220.000.

LaMattina, John L.: *See*—
Walker, Frederick J.; and LaMattina, John L., 4,711,888, Cl. 514-269.000.

Lamb, Haydn R.: *See*—
Barr, John D.; and Lamb, Haydn R., 4,711,144, Cl. 76-108.00A.

Lammert, Michael D., to TRW Inc. Formation of buried diffusion devices. 4,711,017, Cl. 437-20.000.

Landaua, Werner: *See*—
Rommel, Reiner; and Landaua, Werner, 4,711,292, Cl. 164-200.000.

Lande, Martin. Zipper necktie. 4,710,982, Cl. 2-150.000.

Landry, Michel: *See*—
Jeanjean, Robert; Demissy, Daniel; Saint-Jean, Guy; and Landry, Michel, 4,711,978, Cl. 200-148.00A.

Landsman, Douglas A.: *See*—
Luczak, Francis J.; and Landsman, Douglas A., 4,711,829, Cl. 429-44.000.

Lange, Joachim: *See*—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.

Lange, Jurgen, to VDO Adolf Schindling AG. Electrically actuatable fuel-injection valve for internal combustion engines. 4,711,396, Cl. 239-102.200.

Langenbeck, Keith A.; and Holdeman, David A., to Langenbeck, Keith A. Automated system and method for transporting and sorting articles. 4,711,357, Cl. 209-565.000.

Langer, Horst: *See*—
Focke, Heinz; Langer, Horst; and Bretthauer, Hans-Jurgen, 4,711,065, Cl. 53-170.000.

Langer, Pennina R.: *See*—
Ward, David C.; Langer, Pennina R.; and Waldrop, Alexander A., III, 4,711,955, Cl. 536-29.000.

Lass, Bennett D. Portable collapsible darkroom. 4,711,563, Cl. 355-21.000.

Lathers, Michael W.; and Bruning, Richard P., to General Motors Corporation. Vehicle seat construction. 4,711,496, Cl. 297-452.000.

Latto, William, to C-E Industrial Lasers, Incorporated. Laser materials treatment system. 4,712,120, Cl. 346-145.000.

Latza, Joachim; and Mock, Gunther, to Blohm & Voss AG. Self-contained ventilation system units for supplying spaces between bulkheads with individually circulated ventilation air. 4,711,193, Cl. 114-211.000.

Lauer, Janet S.: *See*—
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.

Laufer, Helmut, to Robert Bosch GmbH. Fuel injection pump. 4,711,221, Cl. 123-503.000.

Law, Derek A.: *See*—
Horodysky, Andrew G.; and Law, Derek A., 4,711,736, Cl. 252-47.500.

Lawyer, Frances C.: *See*—
Gelfand, David H.; and Lawyer, Frances C., 4,711,845, Cl. 435-68.000.

Layne, Richard C., to Sahr, Gladys M. Dock seal with lip for sealing door hinge gap. 4,711,059, Cl. 52-173.0DS.

Lederman, Frederick E., to General Motors Corporation. Roller clutch with improved spring guidance. 4,711,330, Cl. 192-45.000.

Lee, Chi-long; and Maxson, Myron T., to Dow Corning Corporation. Moisture cured one-part RTV silicone sealant. 4,711,928, Cl. 524-860.000.

Lee Data Corporation: *See*—
Davis, Loren G.; Schmitz, Steven R.; and Tauer, Dennis L., 4,712,210, Cl. 370-77.000.

Lee, Jimmy. Water temperature control device. 4,711,393, Cl. 236-12.150.

Lee, Myonghi: *See*—
Fujiyama, Seiki; and Lee, Myonghi, 4,712,180, Cl. 364-419.000.

Leedecke, Charles J.: *See*—
Pryor, Michael J.; Leedecke, Charles J.; and Masse, Norman G., 4,712,161, Cl. 361-411.000.

Leenaars, Adriaan F. M.; Burggraaf, Anthonie J.; and Keizer, Klass. Process for the production of crack-free semi-permeable inorganic membranes. 4,711,719, Cl. 210-500.260.

Le Fur, Gerard R.: *See*—
Dubroeucq, Marie-Christine; Le Fur, Gerard R.; and Renault, Christian L. A., 4,711,890, Cl. 514-311.000.

LeGrand, Archie M., Jr.: *See*—
Pregnall, Richard A.; and LeGrand, Archie M., Jr., 4,711,854, Cl. 436-144.000.

Lehmann, Leonard T., to American Cyanamid Company. Surgical filament coating. 4,711,241, Cl. 128-335.500.

Lehr, Bernd C.: *See*—
Koeling, Thijs; Lehr, Bernd C.; and Broekhuizen, Willem, 4,711,303, Cl. 166-250.000.

Lehr, Marvin H., to B. F. Goodrich Company, The. Stabilization of vinyl chloride polymers. 4,711,921, Cl. 524-180.000.

Leibee, Donald L.; and Crist, Owen K., to Marmon Group, Inc., The. Drill bit. 4,711,312, Cl. 175-393.000.

Leiber, Heinz, to Robert Bosch GmbH. Valve arrangement. 4,711,266, Cl. 137-554.000.

Leiby, Susan M.: *See*—
Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., 4,711,710, Cl. 208-111.000.

Leigh, Harold G.; and Schachet, Eli, to Baxter Travenol Laboratories, Inc. Syringe lock. 4,711,637, Cl. 604-220.000.

Leis, Roland: *See*—
Muller, Richard; Leis, Roland; and Zinssmeister, Axel, 4,711,189, Cl. 112-121.120.

Leistner, Walter H., to Sigma Tool & Machine Limited. Nail collator and welder. 4,711,980, Cl. 219-56.000.

Leling, Menno; and Hagenah, Gerhard, to SF-Vollverbundstein-Kooperation GmbH. Shaped (concrete) block for retaining walls and also a retaining wall. 4,711,606, Cl. 405-286.000.

Lenz, Henry G.: *See*—
Shah, Manoj R.; and Lenz, Henry G., 4,712,033, Cl. 310-178.000.

Leone-Bay, Andrea, to Stauffer Chemical Company. Process for selective preparation of ratios of isomers formed on N-substitution of asymmetric imidazoles. 4,711,962, Cl. 548-337.000.

Letica Corporation: *See*—
Letica, Ilija, 4,711,364, Cl. 220-276.000.

Letica, Ilija, to Letica Corporation. Tamper-evident container and closure. 4,711,364, Cl. 220-276.000.

Letsche, Ulrich; Rapp, Wolfgang, deceased (by Rapp, Gilsea, heir); Haefner, Guenther; and Tonhaeuser, Wilhelm, to Daimler-Benz Aktiengesellschaft. Pressure oil guide device for injection pump shaft. 4,711,220, Cl. 123-502.000.

Levendusky, Thomas L.: *See*—
Musselman, Lawrence L.; and Levendusky, Thomas L., 4,711,673, Cl. 106-287.170.

Lever Brothers Company: *See*—
Carter, Malcolm N. A.; and Scowen, Reginald V., 4,711,740, Cl. 252-174.240.
Irwin, Charles F.; Karpusiewicz, William; and Liberati, Patricia, 4,711,748, Cl. 264-117.000.

Levinson, Samuel H.: *See*—
Boldridge, Austin, Jr.; Buell, Scott; and Graham, James M., 4,712,092, Cl. 340-365.00A.

Lew, Hyok S.; and Stranahan, Michael, to Lew, Jung G.; and Lew, Hyok S. Subassembly for geodesically reinforced honeycomb structures. 4,711,057, Cl. 52-81.000.

Lew, Jung G.: *See*—
Lew, Hyok S.; and Stranahan, Michael, 4,711,057, Cl. 52-81.000.

Lewis, Peter R.: *See*—
Cowler, David J. W.; and Lewis, Peter R., 4,711,420, Cl. 248-243.000.

Leyck, Sigurd: *See*—
Welter, Andre ; Leyck, Sigurd; and Etschenberg, Eugen, 4,711,961, Cl. 548-121.000.

Li, Edward; Foss, Leonard; and Cousins, David, to Motorola, Inc. Apparatus and method for electronic ignition control. 4,711,227, Cl. 123-643.000.

Liao, Wei C.: *See*—
Denick, John, Jr.; Peters, David; Talwar, Anil K.; and Liao, Wei C., 4,711,774, Cl. 424-48.000.

Libbey-Owens-Ford Co.: *See*—
Herrington, Richard A.; Kleman, Thomas G.; and Apolinar, Ermelinda A., 4,711,056, Cl. 51-410.000.

Liberati, Patricia: *See*—
Irwin, Charles F.; Karpusiewicz, William; and Liberati, Patricia, 4,711,748, Cl. 264-117.000.

Lifka, Bernard W.: *See*—
Vernam, William D.; and Lifka, Bernard W., 4,711,762, Cl. 420-532.000.

Light Industrial Design Company: *See*—
Martin, Timothy J., Jr.; and Henry, Richard T., 4,711,259, Cl. 134-166.00R.

Lillquist, Robert D.; and Case, Allen W., Jr., to General Electric Company. Method and apparatus for measuring weld penetration in an arc welding process. 4,711,986, Cl. 219-130.010.

Lim Kunststoff Technologie Gesellschaft m.b.H.: *See*—
Schmidt, Oskar, 4,711,284, Cl. 152-452.000.

Lim, Tuan-Kay, to NCR Corporation. Imaging systems employing apparatus for evenly illuminating objects to be scanned. 4,712,002, Cl. 250-216.000.

Linde Aktiengesellschaft: *See*—
Schiller, Helmut, 4,711,771, Cl. 423-359.000.

Lindsey, Thomas O.; and Zavy, Michael T., to SmithKline Beckman Corporation. Animal feed methods and compositions using cysteamine. 4,711,897, Cl. 514-665.000.

Lindstrom, Richard L. Intraocular lens. 4,711,638, Cl. 623-6.000.

Link, David H.; and Lopez, Juan R., to Clark Equipment Company. Method and means for lift truck assembly and servicing. 4,711,467, Cl. 280-785.000.

Link, Helmut: *See*—
Brombacher, Urs; Link, Helmut; and Montavon, Marc, 4,711,889, Cl. 514-297.000.

Liqui-Box Corporation: *See*—
Ulm, John G., 4,711,380, Cl. 222-541.000.

Lisec, Peter. Device for smoothing sealing compounds in insulating glass. 4,711,692, Cl. 156-486.000.

Litton Systems, Inc.: *See*—
Bernardini, Allen J., 4,711,520, Cl. 350-96.200.
Butler, Alfred L., 4,711,575, Cl. 356-350.000.
Feth, John R., 4,711,525, Cl. 350-96.330.
Millman, Ronald W., 4,711,982, Cl. 219-10.55D.

Liu, Chain T.; and Koch, Carl C., to Martin Marietta Energy Systems, Inc. Ductile aluminide alloys for high temperature applications. 4,711,761, Cl. 420-459.000.

Liu, King. Quick-release hub retention device. 4,711,459, Cl. 280-279.000.

Lockett, Michael J.; Summers, Daniel R.; Smith, Vinson C.; and Upchurch, James C., to Union Carbide Corporation. High turndown bubble cap tray. 4,711,745, Cl. 261-114.200.

Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., to Gerber Scientific Products, Inc. Method and apparatus for making a pattern for a lens opening in an eyeglass frame. 4,711,035, Cl. 33-200.000.

Lohaus, Gerhard: *See*—
Dittmar, Walter; Futterer, Eberhard; and Lohaus, Gerhard, 4,711,775, Cl. 424-70.000.

Long, Delmar D., to Dayco Products, Inc. Elastomer-coated bias reinforcement fabric and method for producing same. 4,711,792, Cl. 427-176.000.

Long, Frederick N. Cutting blade and method of use. 4,711,076, Cl. 56-295.000.

Longenecker, Francis S.; Moeder, Kevin J.; and Wolff, Jeffrey L., to TE-Co. Workpiece securing apparatus for a machine tool. 4,711,437, Cl. 269-91.000.

Lopez, Juan R.: *See*—
Link, David H.; and Lopez, Juan R., 4,711,467, Cl. 280-785.000.

Lopp, Loran C., Jr.: *See*—
Bonko, Mark L.; and Lopp, Loran C., Jr., 4,711,283, Cl. 152-209.00B.

Loukanis, Jesse J.; Mathews, Will W.; and Tune, Raymond L., to NL Industries, Inc.; and Cummins Engine Co. Rock bit assembly method. 4,711,143, Cl. 76-108.00A.

Loutfy, Rafik O.: *See*—
McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.

Lu, Kun-Er: *See*—
Gadkaree, Kishor P.; Haynes, William L.; and Lu, Kun-Er, 4,711,860, Cl. 501-9.000.

Lucas Industries: *See*—
Price, Anthony G.; Campbell, Roy; and Green, Andrew P., 4,711,327, Cl. 188-71.400.

Lucas Industries Public Limited Company: *See*—
Abinett, Raymond E., 4,711,618, Cl. 417-462.000.

Luciano, Robert A.: *See*—
Dickinson, Peter D.; and Luciano, Robert A., 4,711,452, Cl. 273-143.00R.

Luczak, Francis J.; and Landsman, Douglas A., to International Fuel Cells Corporation. Ordered ternary fuel cell catalysts containing platinum and cobalt. 4,711,829, Cl. 429-44.000.

Luen, Lam M. Rotary head. 4,711,310, Cl. 175-171.000.

Luft, Johann, to Siemens Aktiengesellschaft. Multiple laser arrangement. 4,712,220, Cl. 372-50.000.

Lumaret, Jean-Claude: *See*—
Gosset, Serge; and Lumaret, Jean-Claude, 4,711,794, Cl. 427-389.900.

Lundstrom, Kurt A.: *See*—
Wallin, P. O. Thomas; Warell, Bengt H.; Svensson, A. Pedar; Lundstrom, Kurt A.; and Johansson, Lars A., 4,711,184, Cl. 108-144.000.

Lung, Dieter; Kluft, Werner; Fabry, Jochen; Wittkopp, Helmut; Dombrowski, Theodor; and Klosterhalfen, Hartwig, to W. Hegenscheidt GmbH. Method for reprofiling profiles of wheel sets. 4,711,146, Cl. 82-1.00C.

Lurssen, Klaus: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.
Kramer, Wolfgang; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,711,657, Cl. 71-92.000.

Luyten, Peter R.; and Den Hollander, Jan A., to U.S. Philips Corporation. Method for the selective excitation of a volume in an object. 4,712,066, Cl. 324-309.000.

Luzzi, Joyce K.: *See*—
Luzzi, Louis A.; and Luzzi, Joyce K., 4,711,904, Cl. 514-464.000.

Luzzi, Louis A.; and Luzzi, Joyce K. Method of treating skin disorders. 4,711,904, Cl. 514-464.000.

Lyons, Michael R., to Rolls-Royce plc. Gas turbine engine fuel systems. 4,711,085, Cl. 60-39.141.

Lyons, Walter: *See*—
Kemp, Paul C.; and Lyons, Walter, 4,711,643, Cl. 44-51.000.

Lyregaard, Poul E., to Oticon Electronics A/S. In-the-ear hearing aid with the outer wall formed by rupturing a two-component chamber. 4,712,245, Cl. 381-68.600.

M/A-COM Government Systems, Inc.: *See*—
Gilhousen, Klein S.; Heller, Jerrold A.; Van Harding, Michael; and Blakeney, Robert D., II, 4,712,238, Cl. 380-20.000.

M.A.N.- Roland Druckmaschinen Aktiengesellschaft: *See*—
Emrich, Helmut; Mathes, Josef; Ochs, Heinrich; and Despot, Janko, 4,711,173, Cl. 101-349.000.
Hummel, Peter; and Steuer, Joachim, 4,711,175, Cl. 101-365.000.
Theilacker, Klaus, 4,711,171, Cl. 101-148.000.

M&T Chemicals Inc.: *See*—
Martyak, Nicholas M.; Corsentino, John A.; and McMullen, Warren H., 4,711,705, Cl. 204-34.000.

M. W. Kellogg Company, The: *See*—
Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A., 4,711,651, Cl. 62-34.000.

MacDonald, Roderick J. Flare stack ignitor. 4,711,629, Cl. 431-264.000.

Machado, Octavio J.; Daugherty, David A.; Andrews, Ronnie H.; and Efferding, Larry E., to Westinghouse Electric Corp. Spent fuel storage cask having basket with grid assemblies. 4,711,758, Cl. 376-272.000.

Machida, Satoshi: *See*—
Hasegawa, Shigekazu; Machida, Satoshi; and Oota, Yoshimi, 4,711,329, Cl. 192-3.570.

Machine Technology, Inc.: *See*—
Riehl, Roger W., 4,711,610, Cl. 409-141.000.

Machines Chambon: *See*—
Michel, Armelin, 4,711,176, Cl. 101-365.000.

Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., to IDC-Chemie AG. Device for treating burn and scald wounds. 4,711,375, Cl. 222-135.000.

Madison-Kipp Corporation: *See*—
Dombroski, Robert M.; and Kayser, John P., 4,711,320, Cl. 184-3.200.

Madsen, Elmer W., to North American Philips Corporation. Shock protective circuit with mechanical latch for small appliances. 4,712,154, Cl. 361-178.000.

Maebayashi, Jiro; and Hamamoto, Masaya, to Mazda Motor Corporation. Open top type automobile body structure. 4,711,485, Cl. 296-108.000.

Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, to Okumura Machinery Corporation; and Seibu Polymer Kasei Kabushiki Kaisha. Rock crushing device. 4,711,501, Cl. 299-21.000.

Maeda, Satoru, to Sony Corporation. Color-signal converting circuit. 4,712,099, Cl. 340-703.000.

Maeda, Takeshi: *See*—
Saito, Atsushi; Ojima, Masahiro; Maeda, Takeshi; and Kato Tsuyoshi, 4,712,203, Cl. 369-13.000.

Maeda, Tatsuo; and Ohya, Takeji, to Mazda Motor Corporation. Vehicle door structure. 4,711,052, Cl. 49-502.000.

Magdenko, Vladimir S.: *See*—
Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.

Magder, Max, to DuBarry Furniture of Canada Limited. Upholstered furniture. 4,711,495, Cl. 297-440.000.

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Cronch, Robert D.; and Koudele, Larry J., 4,712,076, Cl. 331-16.000.

Magni, Dino-Franco: *See*—
Magni, Giuliano, 4,711,067, Cl. 53-439.000.

Magni, Giuliano, to Magni, Giuliano; and Magni, Dino-Franco. Method of packaging a single mattress to a small size to be conveniently carried. 4,711,067, Cl. 53-439.000.

Magnum Piering, Inc.: *See*—
Rippe, Dondeville M., Jr.; and Scaturro, David T., 4,711,603, Cl. 405-230.000.

Malek, Fritz J., to Santa Barbara Research Center. Direction finder system with mirror array. 4,711,998, Cl. 250-203.00R.

Maliczyszyn, Walter: *See*—
Mazzarella, Emil D.; Maliczyszyn, Walter; and Atkinson, Jeffrey, 4,711,671, Cl. 106-243.000.

Mammino, Joseph: *See*—
McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.

MAN Gutehoffnungshutte GmbH: *See*—
Haacker, Heinz; and Wensing, Helmut, 4,711,297, Cl. 165-88.000.

MAN Nutzfahrzeuge GmbH: *See*—
Henkel, Dietmar, 4,711,209, Cl. 123-300.000.

Manfroni, Ezio, to Carpigiani Bruto Macchine Automatiche. Dispensing piston-cock for ice cream making machines. 4,711,376, Cl. 222-146.100.

Mannhardt, Karl: *See*—
Satzinger, Gerhard; Hartenstein, Johannes; Mannhardt, Karl; Kleinschroth, Jurgen; Osswald, Hartmut; Weinheimer, Gunter; and Fritschi, Edgar, 4,711,901, Cl. 514-300.000.

Manns, James M.: *See*—
Porcello, Sam J.; Manns, James M.; Player, Kenneth W.; and Wilson, Lonny L., 4,711,788, Cl. 426-94.000.

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Hennings, David; and Manoukian, Nubar, 4,711,526, Cl. 350-170.000.

Manoury, Philippe; Obitz, Daniel; and Peynot, Michel, to Synthelabo. Certain 5-nitro-2-furyl derivatives of pyridylpropenoic acid hydrazides which are useful in treating bacterial, fungal, protozoal, parasitic and intestinal infections. 4,711,892, Cl. 514-336.000.

Mansfield, Michael R. Exercise apparatus for use with video game. 4,711,447, Cl. 272-73.000.

Marchisi, Giuseppe; and Cognetti De Martiis, Carlo, to SGS-Antes Componenti Elettronici S.p.A. Process for making single-in-line integrated electronic component. 4,711,023, Cl. 29-827.000.

Marcus, Michael A.; and Benson, John E., to Eastman Kodak Company. Beta phase PVF_2 film formed by casting it onto a specially prepared insulating support. 4,711,808, Cl. 428-336.000.

Margerum, Lawrence D.: *See*—
Meyer, Thomas J.; O'Toole, Terrence R.; Margerum, Lawrence D.; Westmoreland, T. David; Vining, William J.; Murray, Royce W.; and Sullivan, B. Patrick, 4,711,708, Cl. 204-280.000.

Marget, Christian; and Rose, Gerard, to Charbonnages de France. Power circuit and trigger device comprising same. 4,712,153, Cl. 361-91.000.

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Tarrson, Emanual B.; and Maric, Dane, 4,710,996, Cl. 15-105.000.

Marino, Michael, to West Penn Plastic, Inc. Tamper evidence closure. 4,711,363, Cl. 220-266.000.

Markbreiter, Stephen J.; and Dessanti, Daniel J., to Kryos Energy Inc.; and Brooklyn Union Gas Company, The. Cogeneration of electricity and refrigeration by work-expanding pipeline gas. 4,711,093, Cl. 62-87.000.

Markoff, Bradley S. Combination handbag and dress accessory item. 4,710,983, Cl. 2-301.000.

Marmon Group, Inc., The: *See*—
Leibee, Donald L.; and Crist, Owen K., 4,711,312, Cl. 175-393.000.

Marquardt, Terry L., to Westinghouse Electric Corp. Motor controller auxiliary contact unit with flexure member. 4,712,079, Cl. 335-132.000.

Marten, O. James: *See*—
Gross, Jonathan; and Marten, O. James, 4,711,623, Cl. 425-376.00A.

Martin, Charles E.: *See*—
Vora, Kishore N.; Carrico, John P., Sr.; Spangler, Glenn E.; Campbell, Donald N.; and Martin, Charles E., 4,712,008, Cl. 250-287.000.

Martin Marietta Energy Systems, Inc.: *See*—
Liu, Chain T.; and Koch, Carl C., 4,711,761, Cl. 420-459.000.

Martin, R. Gregory: *See*—
Offe, Darrell L.; and Martin, R. Gregory, 4,711,086, Cl. 60-253.000.

Martin S.A.: *See*—
Capdebosc, Bernard, 4,711,172, Cl. 101-152.000.

Martin, Timothy J., Jr.; and Henry, Richard T., to Light Industrial Design Company. Milk tank cleaning apparatus and method. 4,711,259, Cl. 134-166.00R.

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Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.

Massa, Andre; and Dupasquier, Guy, to Atochem. Bag packaging machine and method. 4,711,070, Cl. 53-573.000.

Masse, Norman G.: *See*—
Pryor, Michael J.; Leedecke, Charles J.; and Masse, Norman G., 4,712,161, Cl. 361-411.000.

Masubuchi, Sadao, to Citizen Watch Co., Ltd. Ferroelectric liquid crystal display apparatus using a reset voltage step. 4,711,531, Cl. 350-350.00S.

Mathes, Josef: *See*—
Emrich, Helmut; Mathes, Josef; Ochs, Heinrich; and Despot, Janko, 4,711,173, Cl. 101-349.000.

Mathews, Will W.: *See*—
Loukanis, Jesse J.; Mathews, Will W.; and Tune, Raymond L., 4,711,143, Cl. 76-108.00A.

Matsubara, Tamotsu: *See*—
Wakabayashi, Hiroyuki; and Matsubara, Tamotsu, 4,711,806, Cl. 428-334.000.

Matsuda, Susumu: *See*—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.

Matsuki, Kanji: *See*—
Kanoh, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, 4,711,289, Cl. 164-34.000.

Matsumoto, Nobuo: *See*—
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, 4,712,160, Cl. 361-388.000.

Matsumoto, Tsuyoshi: *See*—
Iida, Hiroyuki; Murakami, Haruhiko; Matsumoto, Tsuyoshi; and Kashihara, Junzo, 4,711,313, Cl. 177-127.000.

Matsumura Oil Research Corporation: *See*—
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.

Matsumura, Takashi, to Canon Kabushiki Kaisha. Alignment system allowing alignment when alignment marks are absent. 4,712,016, Cl. 250-548.000.

Matsunaga, Haruyuki: *See*—
Kikuchi, Shunichi; Matsunaga, Haruyuki; Katsumi, Hideo; and Katsuyama, Koji, 4,712,158, Cl. 361-385.000.

Matsuo, Kazumasa: *See*—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.

Matsuo, Masataka: *See*—
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Katou, Akito, 4,712,080, Cl. 335-213.000.
Kidouchi, Yasuo; and Yonekubo, Hiroaki, 4,711,392, Cl. 236-12.120.
Otsuki, Tatsuo; Shimano, Akio; Aoki, Hiromitsu; and Aoki, Ikuko, 4,712,023, Cl. 307-450.000.
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, 4,712,160, Cl. 361-388.000.
Takemura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, 4,712,204, Cl. 369-32.000.
Yamaguchi, Seiji; Ichinohe, Eisuke; and Katsura, Johji, 4,712,194, Cl. 365-203.000.
Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Syunichiro; and Ouchi, Hiromu, 4,711,862, Cl. 501-136.000.
Yoshiike, Nobuyuki; and Kondo, Shigeo, 4,711,815, Cl. 428-411.100.

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Matsuzawa, Soichiro, to NGK Insulators, Ltd. Method of manufacturing a magnetic head core. 4,711,018, Cl. 29-603.000.

Mattei, Riccardo, to G.D. Societa Per Azioni. Apparatus for transporting substantially parallelepipedic packets. 4,711,336, Cl. 198-347.000.

Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., to Blue Circle Industries, PLC. Compositions comprising mineral particles in suspension and method of treating aqueous systems therewith. 4,711,727, Cl. 210-727.000.

Maubois, Jean-Louis: *See*—
Roger, Loic; Maubois, Jean-Louis; Brule, Gerard; and Piot, Michel, 4,711,953, Cl. 530-366.000.

Mauer, George W.: *See*—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.

Max Co., Ltd.: *See*—
Yamaguchi, Morio, 4,711,170, Cl. 101-93.050.

Maxson, Myron T.: *See*—
Lee, Chi-long; and Maxson, Myron T., 4,711,928, Cl. 524-860.000.

Mayo Medical Resources: *See*—
Spelsberg, Thomas C., 4,711,856, Cl. 436-504.000.

Mazda Motor Corporation: *See*—
Maebayashi, Jiro; and Hamamoto, Masaya, 4,711,485, Cl. 296-108.000.
Maeda, Tatsuo; and Ohya, Takeji, 4,711,052, Cl. 49-502.000.

Mazza, Gregory E.: *See*—
Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, 4,711,755, Cl. 376-260.000.
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Mazzarella, Emil D.; Maliczyszyn, Walter; and Atkinson, Jeffrey, to National Starch and Chemical Corporation. Storage stable paper size composition containing ethoxylated lanolin. 4,711,671, Cl. 106-243.000.

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Tega, Ezio; Piccini, Fabrizio; Mazzini, Marco; and Magi, Raffaello, 4,711,015, Cl. 29-566.200.

McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., to Xerox Corporation. Powder coating process for seamless substrates. 4,711,833, Cl. 430-131.000.

McArthur, Jim. Multi-mode exercising apparatus. 4,711,450, Cl. 272-129.000.

McCain Manufacturing Corporation: *See*—
Bulka, Raymond I.; and Nowaczyk, David J., 4,711,440, Cl. 270-53.000.

McCall, John M., to Upjohn Company, The. Isochromans. 4,711,960, Cl. 544-364.000.

McCartney, Ronald L., to American Hospital Supply Corporation. Optical catheter. 4,711,522, Cl. 350-96.210.

McCauley Corporation Limited: *See*—
Glickman, Michael N., 4,711,599, Cl. 404-41.000.

McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., to PPG Industries, Inc.

Cationic coating compositions for electrodeposition over rough steel. 4,711,917, Cl. 523-400.000.

McCoy, Milton E.: *See—*
Boeke, Eric J.; and McCoy, Milton E., 4,711,304, Cl. 166-303.000.

McCready, Russell J.; and Tyrell, John A., to General Electric Company. Polyetherimide esters. 4,711,933, Cl. 525-415.000.

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McGuire, Charles F.; Weber, David J.; and Steyaert, Gordon C., to Sperry Corporation. Active balum star mixer. 4,712,024, Cl. 307-529.000.

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McMahan, David R.; Hallgarth, Leslie H.; and Miller, Gary L., to General Motors Corporation. Vehicle headlamp assembly. 4,712,164, Cl. 362-66.000.

McMullen, Warren H.: *See—*
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McNally, Paul F., to International Cybernetics Corporation. Phase analog encoding system with compensation. 4,712,106, Cl. 340-870.320.

McNamara, Thomas F.; and Confessore, Fred, to State University of New York. Test apparatus for determining a metabolic characteristic of microorganisms. 4,711,851, Cl. 435-287.000.

McNennamy, John A.: *See—*
Charbonneau, Arthur G.; Godfrey, Dwaine A.; McNennamy, John A.; and Nafziger, Steven, 4,712,071, Cl. 324-415.000.

McPherson, Thomas R., to Network Equipment Technologies. System for transmitting digital information and maintaining a minimum paulse density. 4,712,217, Cl. 371-55.000.

McPherson's Limited: *See—*
Somerset, John B., 4,711,029, Cl. 30-148.000.

Mechanical Technology Incorporated: *See—*
Hull-Allen, Gregory, 4,711,577, Cl. 356-373.000.

Medovar, Boris I.: *See—*
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.

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Medtronic, Inc.: *See—*
Stokes, Kenneth B., 4,711,251, Cl. 128-784.000.

Medvid, Richard J., to Duriron Company, Inc., The. Plug valve. 4,711,264, Cl. 137-241.000.

Mehta, Pradip S.; Valsamis, Lefteris N.; and Donoian, Gary S., to Farrel Corporation. Rotary processor for plastic and polymeric materials providing surge compensation. 4,711,581, Cl. 366-99.000.

Meininger, James R.: *See—*
Berchem, Donald J.; and Meininger, James R., 4,711,088, Cl. 60-321.000.

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Schindl, Klaus P.; Meitz, Franz; and Salzmann, Kurt, 4,711,537, Cl. 350-531.000.

Melanson, Ronald J.: *See—*
Guglielmi, Paul M.; Melanson, Ronald J.; and Kotok, Alan, 4,712,190, Cl. 364-900.000.

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Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.

Meller, Yehuda, to State of Israel, Ministry of Defence, Israel Military Industries, The. Signal flare cartridge. 4,711,047, Cl. 42-1.150.

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Mendelson, Ralph A., to Garrett Corporation, The. High temperature bushing alloy. 4,711,677, Cl. 148-325.000.

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Menell, Hans; Ringhoff, Hubert; and Rump, Jurgen, to Continental Gummi-Werke Aktiengesellschaft. Tire build-up machine. 4,711,691, Cl. 156-415.000.

Mennicken, Gerhard: *See—*
Kubitza, Werner; and Mennicken, Gerhard, 4,711,918, Cl. 524-196.000.

Merck & Co., Inc.: *See—*
Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., 4,711,886, Cl. 514-195.000.

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Hausberg, Hans-Heinrich; Bottcher, Henning; Seyfried, Christoph; and Bergmann, Rolf, 4,711,893, Cl. 514-339.000.

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von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, 4,711,906, Cl. 514-561.000.

Merkatoris, John R., to Paper Converting Machine Company. Method and apparatus for making elastic diapers. 4,711,683, Cl. 156-164.000.

Mesch, Keith A.: *See—*
Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., 4,711,920, Cl. 524-178.000.

Mesters, Carolus M. A. M.; Geus, John W.; and Kuijpers, Eugene G. M., to VEG-Gasinstituut N.V. Process for the production of hydrogen. 4,711,773, Cl. 423-655.000.

Mesun, Randy O.; and Schobert, Frank, to Kohler Co. Toilet rim water distributor. 4,710,987, Cl. 4-420.000.

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Watson, Martin J., 4,711,624, Cl. 425-384.000.

Metalmeccanica Gori & Zucchi M.G.Z, S.p.A.: *See—*
Tega, Ezio; Piccini, Fabrizio; Mazzini, Marco; and Magi, Raffaello, 4,711,015, Cl. 29-566.200.

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Andrae , Rainer; and Hofmann, Manfred, 4,711,206, Cl. 123-192.00R.

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Chang, Clarence D.; and Miale, Joseph N., 4,711,970, Cl. 585-415.000.

Michel, Armelin, to Machines Chambon. Ink fountain incorporating individually regulated metering segments. 4,711,176, Cl. 101-365.000.

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Mickos, Kaj. Displaceable protective cover for handtools provided with rotatable disc-shaped tools. 4,711,055, Cl. 51-268.000.

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Guarino, Nicholas, 4,711,438, Cl. 269-152.000.

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Sander, Wilfried; and Mielke, Siegfried, 4,711,208, Cl. 123-271.000.

Mihayashi, Keiji: *See—*
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.

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Miki, Yukio: *See—*
Ando, Makoto; and Miki, Yukio, 4,711,528, Cl. 350-257.000.

Milberger, Lionel J.: *See—*
Pallini, Joseph W., Jr.; and Milberger, Lionel J., 4,711,471, Cl. 285-81.000.

Miles, Richard: *See—*
Cowler, David J. W.; and Lewis, Peter R., 4,711,420, Cl. 248-243.000.

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Hannah, Daniel E.; Miliczky, Eugene W.; Bea, Clifford F.; and Hannah, Martin J., 4,711,013, Cl. 29-402.020.

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McMahan, David R.; Hallgarth, Leslie H.; and Miller, Gary L., 4,712,164, Cl. 362-66.000.

Miller, Reno W.; and Grobmyer, Louis R., to Westinghouse Electric Corp. Calibration of a nuclear reactor core parameter predictor. 4,711,753, Cl. 376-216.000.

Millman, Ronald W., to Litton Systems, Inc. Plastic microwave oven door. 4,711,982, Cl. 219-10.55D.

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Kikuchi, Kaoru; and Shikata, Nobuo, 4,711,707, Cl. 204-145.00R.

Minkler, Jackson D., II, to Computer Poet Corporation. Method and apparatus for generating text. 4,712,174, Cl. 364-200.000.

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Minkow, Roger E.; and Minkow, Julius M., 4,711,448, Cl. 272-118.000.

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Minnesota Mining and Manufacturing Company: *See—*
Bolson, John H., Sr., 4,712,094, Cl. 340-572.000.
Evans, Bruce M., 4,711,566, Cl. 355-41.000.
Grzeskowiak, Nicholas E.; and Philip, James B., Jr., 4,711,838, Cl. 430-568.000.
Wittnebel, Bruce W., 4,711,816, Cl. 428-412.000.

Minobe, Masao: *See—*
Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, 4,711,873, Cl. 502-344.000.

Minolta Camera Kabushiki Kaisha: *See—*
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Nishimori, Kadotaro, 4,711,554, Cl. 355-8.000.
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Mio, Kotaro: *See—*
Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.
Miracle, Gerald H.: *See—*
Fredericks, Kenneth J.; Guerriero, Thomas W.; Miracle, Gerald H.; and Wiegand, Michael R., 4,712,176, Cl. 364-200.000.
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Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, 4,711,550, Cl. 355-3.0SH.
Mitchell, Peter P. Apparatus for and method of setting the height of a desk chair. 4,711,033, Cl. 33-169.00R.
Mitsubishi Chemical Industries Limited: *See—*
Hatano, Masakatsu; Oshima, Kazunori; Ihara, Tatsuya; and Kiyono, Kenichi, 4,711,867, Cl. 502-205.000.
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Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, 4,711,617, Cl. 417-295.000.
Iio, Masaya, 4,712,152, Cl. 361-56.000.
Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, 4,711,091, Cl. 60-517.000.
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.
Naruki, Toshimasa; and Goto, Toshihisa, 4,712,145, Cl. 360-96.500.
Tomita, Satoru; and Adachi, Mitsunori, 4,712,142, Cl. 358-285.000.
Watanabe, Eiki, 4,711,335, Cl. 198-324.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kuwabara, Hideki; Naito, Masato; Watanabe, Teishiro; and Hamada, Tadatsugu, 4,711,287, Cl. 165-34.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, 4,711,433, Cl. 266-222.000.
Mitsubishi Paper Mills, Ltd.: *See—*
Kosaka, Takao; Okumura, Fumio; and Tsukahara, Hirokazu, 4,711,749, Cl. 264-4.700.
Mitsubishi Rayon Co., Ltd.: *See—*
Tahara, Yasuteru; and Koike, Kazuyoshi, 4,711,121, Cl. 73-37.700.
Mitsuta, Yuji: *See—*
Ban, Itsuki; and Mitsuta, Yuji, 4,712,003, Cl. 250-221.000.
Mittelhauser, Bernhard. Support for external rearview vehicular mirror. 4,711,421, Cl. 248-479.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Koizumi, Hiroshi, 4,711,034, Cl. 33-172.00E.
Miura, Katsuhito; and Nakata, Tetsuya, to Osaka Soda Co., Ltd. Polyether polymer or copolymer, monomer therefor, and process for production thereof. 4,711,950, Cl. 528-409.000.
Miura, Masakatsu; and Aoki, Hideyuki, to Aisin-Warner Kabushiki Kaisha. Automatic transmission mechanism. 4,711,138, Cl. 74-761.000.
Miyakawa, Akira: *See—*
Kiyohara, Takehiko; Terasawa, Koji; and Miyakawa, Akira, 4,712,172, Cl. 346-1.100.
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, to Wacom Co., Ltd. Electronic blackboard apparatus. 4,711,977, Cl. 178-18.000.
Miyamoto, Tetsuya: *See—*
Nakamatsu, Toshio; Miyamoto, Tetsuya; and Imada, Kunihiko, 4,711,641, Cl. 8-524.000.
Miyamoto, Yukio: *See—*
Goto, Motoo; Kono, Hiroshi; Asao, Haruhiko; Miyamoto, Yukio; and Igarashi, Toshihiko, 4,711,433, Cl. 266-222.000.
Miyaoka, Shinichiro: *See—*
Wakamori, Fumio; Ohata, Hideo; Miyaoka, Shinichiro; and Funabashi, Motohisa, 4,712,182, Cl. 364-507.000.
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Dynamic memory device. 4,712,123, Cl. 357-23.600.
Miyazaki, Atsushi: *See—*
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.
Miyazaki, Toshihiko: *See—*
Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, 4,711,830, Cl. 430-52.000.
Mizuhara, Howard, to GTE Products Corporation. Method of joining pyrolytic boron nitride. 4,711,386, Cl. 228-121.000.
Mizukami, Masao: *See—*
Takahashi, Yukio; Hayase, Isao; Amano, Keijirou; Mizukami, Masao; and Ishiguri, Masaaki, 4,711,620, Cl. 418-96.000.
Mizuno Corporation: *See—*
Hayashi, Keijiro; and Awano, Toshimi, 4,711,462, Cl. 280-610.000.
Mizuno, Naohito: *See—*
Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, 4,712,082, Cl. 338-4.000.
Mizushima, Toshio: *See—*
Ooyama, Kazuo; Ooki, Kenji; and Mizushima, Toshio, 4,711,201, Cl. 123-73.00A.
Mobil Oil Corporation: *See—*
Chang, Clarence D.; and Miale, Joseph N., 4,711,970, Cl. 585-415.000.
Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., 4,711,710, Cl. 208-111.000.
Gross, Jonathan; and Marten, O. James, 4,711,623, Cl. 425-376.00A.
Hopkins, Daniel N., 4,711,131, Cl. 73-799.000.
Horodysky, Andrew G.; and Law, Derek A., 4,711,736, Cl. 252-47.500.
Jennings, Alfred R., Jr., 4,711,302, Cl. 166-250.000.
Schatz, Klaus W., 4,711,712, Cl. 208-153.000.
Mobil Solar Energy Corporation: *See—*
Stormont, Richard W.; and Eriss, Lawrence, 4,711,695, Cl. 156-608.000.
Mock, Gunther: *See—*
Latza, Joachim; and Mock, Gunther, 4,711,193, Cl. 114-211.000.
Modone, Eros: *See—*
Roba, Giacomo; and Modone, Eros, 4,711,652, Cl. 65-18.200.
Moeder, Kevin J.: *See—*
Longenecker, Francis S.; Moeder, Kevin J.; and Wolff, Jeffrey L., 4,711,437, Cl. 269-91.000.
Mogi, Toshiaki: *See—*
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.
Mohndruck Graphische Betriebe GmbH: *See—*
Kwauka, Gerd-Georg, 4,711,612, Cl. 414-68.000.
Mohri, Shunji, to Hitachi, Ltd. Table driven translator. 4,712,189, Cl. 364-900.000.
Momiyama, Kikuo: *See—*
Matsushita, Takashi; Takahashi, Sadatoshi; Ikemori, Keiji; Kitagishi, Nozomu; Tanaka, Tsunefumi; and Momiyama, Kikuo, 4,711,534, Cl. 350-426.000.
Monarch Marking Systems, Inc.: *See—*
Duchin, Daniel, 4,711,369, Cl. 221-213.000.
Montavon, Marc: *See—*
Brombacher, Urs; Link, Helmut; and Montavon, Marc, 4,711,889, Cl. 514-297.000.
Moon, William G.; Westwood, Donald C.; and Stone, Thomas R., to Plus Development Corporation. Thin and compact micro-Winchester head and disk assembly. 4,712,146, Cl. 360-97.000.
Moore, Michael L., to SmithKline Beckman Corporation. 6-pen-vasopressin compounds. 4,711,877, Cl. 514-11.000.
Moore, William P. Attrition resistant controlled release fertilizers. 4,711,659, Cl. 71-93.000.
Moran, John C.: *See—*
Weisenbarger, Gale M.; and Moran, John C., 4,711,271, Cl. 137-827.000.
Moran, Lyle E.: *See—*
Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, 4,711,672, Cl. 106-281.00R.
Morel, Didier: *See—*
Morel, Jacques; and Morel, Didier, 4,711,975, Cl. 174-92.000.
Morel, Jacques; and Morel, Didier, to Etablissements Morel - Ateliers Electromecaniques de Favieres. Protective sleeve and a method for protecting cable splices. 4,711,975, Cl. 174-92.000.
Morell, Joseph; and Demarchi, Jean-Louis, to Salomon S.A. Closing and tightening apparatus for a rear-entry ski boot. 4,711,042, Cl. 36-50.000.
Morey, William W.; and Snitzer, Elias, to United States of America, Navy. Combustor fiberscope. 4,711,524, Cl. 350-96.250.
Morflex Chemical Company, Inc.: *See—*
Hull, Ezekiel H.; and Frappier, Edward P., 4,711,922, Cl. 524-310.000.
Morgan, Bryan J.: *See—*
Ford, Victoria L.; and Morgan, Bryan J., 4,711,275, Cl. 141-95.000.
Mori, Hisako: *See—*
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, 4,712,160, Cl. 361-388.000.
Mori, Kei. Light radiator for diffusing light rays which have been transmitted through an optical conductor. 4,711,513, Cl. 350-96.100.
Mori, Maurizio; Babuin, Piero; and Cargnel, Giuseppe, to Zanussi Elettrodomestici S.p.A. Controlling device for clothes washing machine. 4,711,103, Cl. 68-12.00R.
Mori, Shinji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing wind-up force limiting apparatus. 4,711,408, Cl. 242-107.000.
Morikawa Sangyo Kabushiki Kaisha: *See—*
Kanoh, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, 4,711,289, Cl. 164-34.000.
Morikawa, Tuneo: *See—*
Kabe, Kazuyuki; Morikawa, Tuneo; and Takahashi, Shuji, 4,711,286, Cl. 152-527.000.
Morino, Ronald: *See—*
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
Morishige, Yukio, to NEC Corporation. Optical CVD method with a strong optical intensity used during an initial period and device therefor. 4,711,790, Cl. 427-10.000.
Morris, Eddy. Pendulum operated oscillating bow sight. 4,711,036, Cl. 33-265.000.
Morrison, Alberta J. Puppet speaker. 4,712,246, Cl. 381-77.000.
Morrison, Melvin M. Inertial measurement unit. 4,711,125, Cl. 73-178.00R.
Morsey, Donald M. Air-water nozzle for a spa tank. 4,710,990, Cl. 4-542.000.
Morton Thiokol, Inc.: *See—*
Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., 4,711,920, Cl. 524-178.000.

Rei, Nuno M.; and Wilson, Ronald C., 4,711,914, Cl. 523-122.000.
Mossbarger, George R. Throw away cat litter box. 4,711,198, Cl. 119-1.000.
Motorola, Inc.: *See—*
Baskett, Ira E., 4,712,193, Cl. 365-190.000.
Ecklund, Lawrence M., 4,712,241, Cl. 381-15.000.
Li, Edward; Foss, Leonard; and Cousins, David, 4,711,227, Cl. 123-643.000.
Mischenko, Nicholas, 4,711,361, Cl. 220-4.00F.
Pigott, John M., 4,712,026, Cl. 307-600.000.
Sood, Lal C., 4,712,197, Cl. 365-230.000.
Motosugi, Takanori: *See—*
Yuyama, Yukihiro; Motosugi, Takanori; Honda, Yasuhiro; and Ichikawa, Akira, 4,711,874, Cl. 503-206.000.
Motoya, Kaoru: *See—*
Nishizawa, Junichi; and Motoya, Kaoru, 4,712,122, Cl. 357-22.000.
Motul S.A.: *See—*
Asper, Jean-Jacques; and Cottenceau, Remi, 4,710,984, Cl. 2-412.000.
Mountz, Craig E., to Ammco Tools, Inc. Wheel chock assembly. 4,711,325, Cl. 188-32.000.
Mowatt-Larssen, Erling, to General American Transportation Corporation. External purge system for a tank train. 4,711,274, Cl. 141-5.000.
Mraz, Joseph: *See—*
Wynosky, Charles E.; and Mraz, Joseph, 4,711,607, Cl. 406-30.000.
Mross, Wolf D.: *See—*
Hoelderich, Wolfgang; Biffar, Werner; Irgang, Matthias; Mross, Wolf D.; Kroener, Michael; and Ambach, Eberhard, 4,711,930, Cl. 502-209.000.
Mucha, John A.: *See—*
Bossard, Peter R.; and Mucha, John A., 4,711,118, Cl. 73-73.000.
Mueller, Richard A.; Partis, Richard A.; and Deason, James R., to G. D. Searle & Co. Phenolic thioethers as inhibitors of 5-lipoxygenase. 4,711,903, Cl. 514-381.000.
Muenzner, Wulf: *See—*
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,712,148, Cl. 360-132.000.
Mugrauer, Hubert; Puritscher, Ernst; and Wittmann, Franz, to Siemens Aktiengesellschaft. Mechanism for the drive of actuation elements movable in sealed regions of non-mechanical printer or copier means. 4,711,564, Cl. 355-30.000.
Mukaida, Yoshito: *See—*
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.
Muller, Adam: *See—*
Goller, Ernst; Muller, Adam; and Hermann, Udo, 4,711,101, Cl. 66-64.000.
Muller, Bernard L.: *See—*
Schulte-Elte, Karl-Heinrich; Ohloff, Gunther; Muller, Bernard L.; and Giersch, Wolfgang K., 4,711,875, Cl. 512-1.000.
Muller, Klaus: *See—*
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.
Muller, Klaus-Helmut: *See—*
Kluth, Joachim; Muller, Klaus-Helmut; and Pfister, Theodor, 4,711,959, Cl. 544-320.000.
Muller, Richard; Leis, Roland; and Zinssmeister, Axel, to Pfaff Industriemaschinen GmbH. Sewing arrangement with feed device. 4,711,189, Cl. 112-121.120.
Muller, Rudolph R. M., to Multifastener Corporation. Method of installing a female element to a panel and installation apparatus. 4,711,021, Cl. 29-798.000.
Muller, Walter R., to Carl Freudenberg, Firma. Moistening agent for offset printing plates. 4,711,670, Cl. 106-155.000.
Multifastener Corporation: *See—*
Muller, Rudolph R. M., 4,711,021, Cl. 29-798.000.
Mumcu, Salih; Panoch, Hans J.; and Rueter, Joern, to Huls Aktiengesellschaft. Process for preparing polyamide-based, pulverulent coating compositions for high molecular weight post condensation, employing the precipitation procedure. 4,711,925, Cl. 524-417.000.
Munekata, Seiji: *See—*
Kojima, Masaki; and Munekata, Seiji, 4,711,926, Cl. 524-512.000.
Munemoto, Yoshikazu: *See—*
Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, 4,711,105, Cl. 68-23.200.
Munroe, Albert P.: *See—*
Meyer, Jeffry R.; Munroe, Albert P.; and Bolin, Philip C., 4,711,973, Cl. 174-14.00R.
Murakamai, Yuichi: *See—*
Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased; and Murakamai, Yuichi, 4,711,870, Cl. 502-303.000.
Murakami, Haruhiko: *See—*
Iida, Hiroyuki; Murakami, Haruhiko; Matsumoto, Tsuyoshi; and Kashihara, Junzo, 4,711,313, Cl. 177-127.000.
Murakami, Kakuichi: *See—*
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.
Murakami, Kakuji: *See—*
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.
Murakami, Keisuke: *See—*
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.
Murakami, Shigeo, to Dainippon Screen Mfg. Co., Ltd. Image reader with plural pickup elements reading overlapping image regions of an original image. 4,712,134, Cl. 358-213.130.
Murase, Masao: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
Murata Kikai Kabushiki Kaisha: *See—*
Shibazaki, Toshimi; and Nakayama, Teruo, 4,711,080, Cl. 57-207.000.
Murata, Takahiko: *See—*
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
Murray, Royce W.: *See—*
Meyer, Thomas J.; O'Toole, Terrence R.; Margerum, Lawrence D.; Westmoreland, T. David; Vining, William J.; Murray, Royce W.; and Sullivan, B. Patrick, 4,711,708, Cl. 204-280.000.
Muschner, Udo: *See—*
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.
Musselman, Lawrence L.; and Levendusky, Thomas L., to Aluminum Company of America. Combination of surface modifiers for powdered inorganic fillers. 4,711,673, Cl. 106-287.170.
Mutoh, Yoshiyuki: *See—*
Nagata, Tomizou; Mutoh, Yoshiyuki; and Kobayashi, Kazutaka, 4,711,339, Cl. 198-419.000.
Mycro Group Co.: *See—*
Gordin, Myron K.; and Drost, James L., 4,712,167, Cl. 362-233.000.
N/C Industries: *See—*
Brown, Larry D.; and Brown, Kevin D., 4,711,482, Cl. 294-19.100.
Nabisco Brands: *See—*
Porcello, Sam J.; Manns, James M.; Player, Kenneth W.; and Wilson, Lonny L., 4,711,788, Cl. 426-94.000.
Nabisco Brands, Inc.: *See—*
Spiel, Albert; Roe, James; and Spanier, Henry C., 4,711,425, Cl. 249-117.000.
Naefe, Herbert: *See—*
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.
Nafziger, Steven: *See—*
Charbonneau, Arthur G.; Godfrey, Dwaine A.; McNennamy, John A.; and Nafziger, Steven, 4,712,071, Cl. 324-415.000.
Nagai, Kiyofumi: *See—*
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.
Nagano, Shuji: *See—*
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
Nagasawa, Kiyoshi; Inoue, Toru; and Kashiwazaki, Susumu, to Hitachi, Ltd. Control system for brushless DC motor. 4,712,050, Cl. 318-254.000.
Nagashima, Michiyoshi: *See—*
Takemura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, 4,712,204, Cl. 369-32.000.
Nagashima, Shigeo: *See—*
Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, 4,712,175, Cl. 364-200.000.
Nagashima, Yoshikazu: *See—*
Iino, Tadashi; Nagashima, Yoshikazu; and Sugita, Masaya, 4,711,544, Cl. 353-14.000.
Nagata, Tomizou; Mutoh, Yoshiyuki; and Kobayashi, Kazutaka, to Japan Tobacco, Inc. Cigarette stacking method and apparatus. 4,711,339, Cl. 198-419.000.
Naito, Masato: *See—*
Kuwabara, Hideki; Naito, Masato; Watanabe, Teishiro; and Hamada, Tadatsugu, 4,711,287, Cl. 165-34.000.
Nakagawa, Tatsuhiko: *See—*
Kuritani, Kazushige; and Nakagawa, Tatsuhiko, 4,712,209, Cl. 370-13.000.
Nakamatsu, Toshio; Miyamoto, Tetsuya; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Reactive dye composition: mixture of reactive copper phthalocyanine dyes: dichloro-triazinyl dye and vinyl sulphonyl type dye. 4,711,641, Cl. 8-524.000.
Nakamura, Hideki: *See—*
Takai, Haruki; Ujiie, Mikio; and Nakamura, Hideki, 4,712,212, Cl. 370-104.000.
Nakamura, Hiroyasu, to NEC Corporation. Multiple access radio telephone system selectively operating on full-duplex and half-duplex modes. 4,712,229, Cl. 379-58.000.
Nakamura, Kenji: *See—*
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Nakamura, Takeaki: *See—*
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Nakamura, Yoshisada: *See—*
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.
Nakamura, Yukio. Method of producing propeller shafts for jet-propelled small-sized boats. 4,711,008, Cl. 29-156.80P.
Nakanishi, Hiroshi: *See—*
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.
Nakanowatari, Jun; and Kano, Mitsuru, to Alps Electric Co., Ltd. Liquid crystal device having birefringent plate next to polarizer. 4,711,530, Cl. 350-339.00R.
Nakata, Tetsuya: *See—*
Miura, Katsuhito; and Nakata, Tetsuya, 4,711,950, Cl. 528-409.000.
Nakayama, Takehisa: *See—*
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,711,807, Cl. 428-334.000.
Nakayama, Teruo: *See—*
Shibazaki, Toshimi; and Nakayama, Teruo, 4,711,080, Cl. 57-207.000.
Nakazato, Susumu, to Westinghouse Electric Corp. Control rod displacement. 4,711,756, Cl. 376-327.000.
Nakov, Anton I.: *See—*
Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Veselina B; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.
Nalco Chemical Company: *See—*
Johnson, Donald A., 4,711,724, Cl. 210-699.000.
Pierce, Claudia C.; Robinson, Robert S.; and Kneller, James F., 4,711,726, Cl. 210-701.000.
Napier, Brian A.; and Fisher, Maurice J., to Coal Industry (Patents) Limited. Fluidized beds. 4,711,039, Cl. 34-57.00A.
Narjes, Ferdinand, to Siemens Aktiengesellschaft. Data transmission facility. 4,711,976, Cl. 178-2.00C.
Naruki, Toshimasa; and Goto, Toshihisa, to Mitsubishi Denki Kabushiki Kaisha. Operating mechanism for small portable cassette tape player. 4,712,145, Cl. 360-96.500.
National Nuclear Corporation Limited: *See—*
Aspden, Garth J., 4,712,015, Cl. 250-517.100.
National Research Development Corporation: *See—*
Chaimowicz, Jean-Claude A., 4,711,578, Cl. 356-375.000.
Streat, Michael; and Belfer-Canterman, Sofia, 4,711,863, Cl. 502-5.000.
National Starch and Chemical Corporation: *See—*
Mazzarella, Emil D.; Maliczyszyn, Walter; and Atkinson, Jeffrey, 4,711,671, Cl. 106-243.000.
Natoli, John: *See—*
Amick, David R.; Hann, William M.; and Natoli, John, 4,711,725, Cl. 210-701.000.
Naumann, Bernd: *See—*
Quillfeldt, Winfried; Naumann, Bernd; and Becker-Ross, Helmut, 4,711,572, Cl. 356-311.000.
Naylor, Harry, to General Ionex Corporation. Charge conversion unit for negative ion source. 4,712,012, Cl. 250-423.00R.
NCR Canada Ltd - NCR Canada Ltee: *See—*
Brooks, Ralf M.; Connell, Brian P.; Sonnenburg, Dennis T.; and Pagowski, Stefan J., 4,712,113, Cl. 346-1.100.
NCR Corporation: *See—*
Lim, Tuan-Kay, 4,712,002, Cl. 250-216.000.
NEC Corporation: *See—*
Amano, Haruo, 4,711,699, Cl. 437-52.000.
Kuritani, Kazushige; and Nakagawa, Tatsuhiko, 4,712,209, Cl. 370-13.000.
Morishige, Yukio, 4,711,790, Cl. 427-10.000.
Nakamura, Hiroyasu, 4,712,229, Cl. 379-58.000.
Takai, Haruki; Ujiie, Mikio; and Nakamura, Hideki, 4,712,212, Cl. 370-104.000.
Yamada, Kouichi, 4,712,090, Cl. 340-347.0DD.
Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: *See—*
Verbeek, Pieter W.; Klaase, Theodorus A.; and Theil, Arne, 4,712,037, Cl. 310-323.000.
Needs, Kathy A.: *See—*
Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., 4,711,255, Cl. 131-330.000.
Nelen, Petrus R., to AGFA-Gevaert N.V. Vacuum contact exposure apparatus. 4,711,570, Cl. 355-91.000.
Nelson, Blaine J., to Rockwell International Corporation. Linear all-digital phase locked loop. 4,712,223, Cl. 377-43.000.
Nelson, Blaine J., to Rockwell International Corporation. Offset digitally controlled oscillator. 4,712,224, Cl. 377-43.000.
Nelson, Blaine J., to Rockwell International Corporation. Phase quantizer apparatus. 4,712,225, Cl. 377-43.000.
Nelson, Dennis L.: *See—*
Callthorp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L., 4,711,716, Cl. 210-136.000.
Nelson, Gunner E., to Ethyl Corporation. Preparation of alkyl silanes. 4,711,965, Cl. 556-478.000.
Nelson, Gunner E., to Ethyl Corporation. Preparation of alkyl silanes. 4,711,966, Cl. 556-478.000.
Nelson, Sidney G., Jr., to Sanitech, Inc. Ion-selective water filter. 4,711,718, Cl. 210-282.000.
Network Equipment Technologies: *See—*
McPherson, Thomas R., 4,712,217, Cl. 371-55.000.
Neubert, Vernon H.; and Perrone, Nicholas, to United States of America, Navy. Combination energy absorbing foundation. 4,711,424, Cl. 248-636.000.
Neuhalfen, Michael A.; Ridoux, Frank E.; and Edenborough, John S., to General Motors Corporation. Internal combustion engine ignition system. 4,711,226, Cl. 123-609.000.
Neupert, Daniel: *See—*
Hofmann, Jurgen; Huschka, Hans; and Neupert, Daniel, 4,711,185, Cl. 110-215.000.
New Holland Inc.: *See—*
Bernhardt, Richard P.; and Bowman, Robert L., 4,711,252, Cl. 130-27.00S.
Strong, Russell W., 4,711,075, Cl. 130-27.00J.
Newton, Feaster H.; and Wang, Kenneth Y., to Burlington Industries, Inc. Roving blending for making sheath/core spun yarn. 4,711,079, Cl. 57-12.000.
Ng, Kenny Y.: *See—*
Warwick, Alastair A.; Schenkel, David P.; and Ng, Kenny Y., 4,712,213, Cl. 371-15.000.
NGK Insulators, Ltd.: *See—*
Matsuzawa, Soichiro, 4,711,018, Cl. 29-603.000.
Nichol-Landry, Deborah J.: *See—*
McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.
Nick, Erich; Guse, Gunter; and Asmussen, Bodo. Medicinal self-adhesive plaster. 4,711,781, Cl. 424-446.000.
Nicosia, Salvatore J.: *See—*
Johnson, Van B.; and Nicosia, Salvatore J., 4,712,228, Cl. 378-185.000.
Nielsen, Lawrence E.: *See—*
Nielsen, Orlan S.; and Nielsen, Lawrence E., 4,711,446, Cl. 272-70.100.
Nielsen, Orlan S.; and Nielsen, Lawrence E. Stilt. 4,711,446, Cl. 272-70.100.
Niinomi, Masahiro: *See—*
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.
Nilsen, Ole K. Programmable electronic plug-in timer. 4,712,019, Cl. 307-141.000.
Nilson, Ben A.; and Shepherd, Roger D., to International Business Machines Corporation. Synchronizing electrostatic copy formation. 4,711,552, Cl. 355-3.00R.
Nilsson, Einar W. Straightening machines and methods. 4,711,112, Cl. 72-98.000.
Nimbus Water Systems, Inc.: *See—*
Bray, Donald T., 4,711,723, Cl. 210-652.000.
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, to Casio Computer Co., Ltd. Speech recognition apparatus. 4,712,243, Cl. 381-43.000.
Nipp, Hansjorg: *See—*
Blaas, Karl; and Nipp, Hansjorg, 4,711,308, Cl. 173-162.00R.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Takeda, Fumiteru; Hirano, Katsuhiko; and Inagaki, Yoshihiro, 4,711,148, Cl. 84-1.010.
Nippon Jiryoku Senko Co., Ltd.: *See—*
Harada, Akihisa, 4,711,662, Cl. 75-1.00R.
Nippon Kogaku K.K.: *See—*
Tanimoto, Akikazu, 4,711,567, Cl. 355-53.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.
Nippon Sheet Glass Co., Ltd.: *See—*
Iida, Naohiro, 4,711,654, Cl. 65-172.000.
Nippon Shinyaku Co., Ltd.: *See—*
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.
Nippon Soken, Inc.: *See—*
Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, 4,712,082, Cl. 338-4.000.
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
Nippon Steel Corporation: *See—*
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.
Nippondenso Co., Ltd.: *See—*
Haraguchi, Hiroshi; and Sakakibara, Koji, 4,711,212, Cl. 123-425.000.
Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, 4,711,990, Cl. 219-552.000.
Sakakibara, Koji; and Haraguchi, Hiroshi, 4,711,213, Cl. 123-425.000.
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, 4,711,214, Cl. 123-425.000.
Takeuchi, Yukihisa; and Takagi, Makoto, 4,711,795, Cl. 427-130.000.
Tsukahara, Kenji; and Abe, Taizou, 4,711,616, Cl. 417-216.000.
Wakabayashi, Hiroyuki; and Matsubara, Tamotsu, 4,711,806, Cl. 428-334.000.

Nishida, Masamitsu: *See*—
Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Syunichiro; and Ouchi, Hiromu, 4,711,862, Cl. 501-136.000.

Nishida, Minoru: *See*—
Ito, Novuei; Nishida, Minoru; Mizuno, Naohito; and Hattori, Tadashi, 4,712,082, Cl. 338-4.000.

Nishigaki, Shinichi: *See*—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.

Nishihara, Toshikazu: *See*—
Ando, Toshio; Nishihara, Toshikazu; and Kimura, Akihiro, 4,711,810, Cl. 428-336.000.

Nishii, Kazuhiko: *See*—
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, 4,712,160, Cl. 361-388.000.

Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mitsuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,711,809, Cl. 428-336.000.

Nishimori, Kadotaro, to Minolta Camera Kabushiki Kaisha. Scanning type copying machine. 4,711,554, Cl. 355-8.000.

Nishimori, Kadotaro; Yoshida, Keiji; and Ohira, Tadashi, to Minolta Camera Kabushiki Kaisha. Original illumination device with an automatic illumination control. 4,711,569, Cl. 355-69.000.

Nishimura, Eiji; Takigawa, Tadahiro; and Kato, Yoshihide, to Kabushiki Kaisha Toshiba. Method of forming a fine pattern with a charged particle beam. 4,712,013, Cl. 250-492.200.

Nishimura, Shinichi: *See*—
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,540, Cl. 351-214.000.
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,541, Cl. 351-214.000.

Nishimura, Takashi: *See*—
Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, 4,712,038, Cl. 313-2.100.

Nishiyama, Masaki, to Canon Kabushiki Kaisha. Pattern output apparatus. 4,712,188, Cl. 364-900.000.

Nishiyama, Yoshihisa: *See*—
Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, 4,711,314, Cl. 177-164.000.

Nishizawa, Junichi; and Motoya, Kaoru, to Research Development Corp.; Nishizawa, Junichi; and Motoya, Kaoru. Heterojunction gate ballistic JFET with channel thinner than Debye length. 4,712,122, Cl. 357-22.000.

Niskanen, Heikki, to Oy Wartsila AB. Method and apparatus for fixing an end of a web on a core tube in a web reeling machine. 4,711,405, Cl. 242-66.000.

Niske, Jorgen, to Tetra Pak International AB. Material for packing containers. 4,711,797, Cl. 428-35.000.

Nissan Motor Co., Ltd.: *See*—
Kato, Takatsugu; and Takahashi, Takao, 4,711,273, Cl. 139-116.000.
Kita, Toru, 4,711,134, Cl. 73-862.360.
Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, 4,712,211, Cl. 370-100.000.

Nisshin Seiki Kabushiki Kaisha: *See*—
Kobayashi, Minoru, 4,711,257, Cl. 134-56.00R.

Nitro Nobel AB: *See*—
Ehrnstrom, Hans, 4,711,678, Cl. 149-2.000.

Niwa, Kiyomi; and Kozawa, Yutaka, to Kabushiki Kaisha Toshiba. Ventilator of the heat exchange type. 4,711,293, Cl. 165-4.000.

NL Industries, Inc.: *See*—
Barr, John D.; and Lamb, Haydn R., 4,711,144, Cl. 76-108.00A.
Loukanis, Jesse J.; Mathews, V. III W.; and Tune, Raymond L., 4,711,143, Cl. 76-108.00A.

Noell, Godwin L.: *See*—
Sundberg, Jack G.; and Noell, Godwin L., 4,711,619, Cl. 418-27.000.

Nohira, Hidetaka: *See*—
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.

Nold, Robert D., to Sundstrand Corporation. Generator high temperature electrical lead assembly. 4,712,029, Cl. 310-71.000.

Nomura, Masahiro: *See*—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.

Nomura, Tadatoshi: *See*—
Enomoto, Hiroshi; Nomura, Tadatoshi; Aoyagi, Yoshiaki; Chokai, Shoichi; Fujita, Yukio; Kono, Tatsuhiko; Murase, Masao; Inoue, Kichiro; and Adachi, Masahiro, 4,711,898, Cl. 514-312.000.

Noorily, Peter, to Thomas & Betts Corporation. Electrical connector and latching apparatus therefor. 4,711,507, Cl. 439-292.000.

Noorily, Peter, to Thomas & Betts Corporation. Latching apparatus for an electrical connector. 4,711,511, Cl. 439-347.000.

Norcross, Kenneth L., III: *See*—
Calltharp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L., 4,711,716, Cl. 210-136.000.

Norden Laboratories, Inc.: *See*—
Bass, Edmund P.; and Sharpee, Richard L., 4,711,778, Cl. 424-89.000.

Nordson Corporation: *See*—
Price, Richard P., 4,711,379, Cl. 222-504.000.

North American Philips Corporation: *See*—
Carleton, Samuel A.; and King, Norman R., 4,712,040, Cl. 313-331.000.
Madsen, Elmer W., 4,712,154, Cl. 361-178.000.
Stupp, Edward H., 4,712,124, Cl. 357-23.400.

North, Bernard: *See*—
Yeckley, Russel L.; and North, Bernard, 4,711,644, Cl. 51-307.000.

Northern Telecom Limited: *See*—
Warwick, Alastair A.; Schenkel, David P.; and Ng, Kenny Y., 4,712,213, Cl. 371-15.000.

Northrop Corporation: *See*—
Binden, John A., 4,711,415, Cl. 244-17.190.

Norton Company: *See*—
Scott, John J., 4,711,750, Cl. 264-144.000.

NovaGene, Inc.: *See*—
Kit, Malon; and Kit, Saul, 4,711,850, Cl. 435-235.000.

Nowaczyk, David J.: *See*—
Bulka, Raymond I.; and Nowaczyk, David J., 4,711,440, Cl. 270-53.000.

Nowinski, Robert C.; and Hoffman, Allan S., to Genetic Systems Corporation. Polymerization-induced separation immunoassays. 4,711,840, Cl. 435-7.000.

Noyori, Ryoji: *See*—
Hazato, Atsuo; Sugiura, Satsohi; Kurozumi, Seizi; and Noyori, Ryoji, 4,711,895, Cl. 514-530.000.

Nozaki, Mineo; and Asakura, Osamu, to Canon Kabushiki Kaisha. Printer for printing by ink transfer. 4,711,5?1, Cl. 400-225.000.

Nugier, John G., to Rockwell International Corporation. Apparatus for extracting an element from an assembly. 4,711,011, Cl. 29-239.000.

Nukem GmbH: *See*—
Hofmann, Jurgen; Huschka, Hans; and Neupert, Daniel, 4,711,185, Cl. 110-215.000.

Numata, Hidetaka, to Alps Electric Co., Ltd. Servo control for motor having cutoff device for preventing motor from being locked. 4,712,053, Cl. 318-663.000.

Nunlist, Erwin J., to Kennecott Corporation. Apparatus for avoiding thermal stresses in glass lined vessels. 4,711,296, Cl. 165-47.000.

Nyman, Lars-Erik, to Flygt AB. Device for breeding fish and shellfish. 4,711,199, Cl. 119-3.000.

Nytol Enterprises Limited: *See*—
Knight, Robert G.; Klat, Samir R.; and Unwin, Kenneth, 4,711,309, Cl. 175-93.000.

O/Y Kyro A/B Tamglass: *See*—
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,712,086, Cl. 338-315.000.

Obara, Kazuaki: *See*—
Takemura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, 4,712,204, Cl. 369-32.000.

Obara, Sanshiro: *See*—
Omae, Tsutomu; Obara, Sanshiro; Kubo, Kenji; and Watanabe, Masahiko, 4,712,052, Cl. 318-625.000.

Oberly, Charles E.; Gegel, Harold L.; and Ho, James C., to United States of America, Air Force. Composite aluminum conductor for pulsed power applications at cryogenic temperatures. 4,711,825, Cl. 428-614.000.

Obitz, Daniel: *See*—
Manoury, Philippe; Obitz, Daniel; and Peynot, Michel, 4,711,892, Cl. 514-336.000.

Oce-Nederland B.V.: *See*—
Geurts, Petrus A. M., 4,711,444, Cl. 271-290.000.
Pothast, Lambertus A.; Grootentraast, Johannes P.; and Verdonschot, Joannes F. J., 4,711,562, Cl. 355-16.000.
Reinten, Hans, 4,712,116, Cl. 346-107.00R.
Roodbeen, Leonardus F. H., 4,711,549, Cl. 355-3.0FU.

Ochab, Douglas C. Weight lifting safety device. 4,711,449, Cl. 272-123.000.

Ochs, Heinrich: *See*—
Emrich, Helmut; Mathes, Josef; Ochs, Heinrich; and Despot, Janko, 4,711,173, Cl. 101-349.000.

Oda, Tatsuharu: *See*—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.

Oda, Yukio: *See*—
Tsujiuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, 4,711,054, Cl. 51-165.770.

Odaira, Keikichi, to Yojigen Agricultural Corporation. Livestock feed and manufacturing method thereof. 4,711,787, Cl. 426-31.000.

Odgaard, A. Jacob; and Kennedy, John F., to University of Iowa Research Foundation. Vanes for bank protection and sediment control in rivers. 4,711,597, Cl. 405-25.000.

Oechslin, Ludwig; Giger, Urs; and Sporing, Jorg, to Ulysse Nardin S.A. Astronomical wrist-watch. 4,711,583, Cl. 368-16.000.

Oeschsle, Manfred; Szieslo, Uwe; Streb, Karl-Peter; and Simm, Wolfgang, to Castolin S.A. Device for the thermal spray application of fusible materials. 4,711,627, Cl. 431-30.000.

Oetiker, Hans. Fastening arrangement for open hose clamp. 4,711,001, Cl. 24-20.0TT.

Offe, Darrell L.; and Martin, R. Gregory, to United States of America, Navy. Trident II first and second stage internal insulation. 4,711,086, Cl. 60-253.000.

Ogawa, Izumi: *See*—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.

Ogawa, Masaki; and Kudo, Takabumi, to Bridgestone Corporation. High-performance pneumatic tire having bead fillers of anisotropic elasticity. 4,711,285, Cl. 152-458.000.

Ogawa, Yasuaki: *See*—
Okada, Hiroaki; Ogawa, Yasuaki; and Yashiki, Takatsuka, 4,711,782, Cl. 424-455.000.

Ogden, Jeffrey D.: *See*—
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,156, Cl. 92-31.000.
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,157, Cl. 92-31.000.

Ogiro, Kenji: *See*—
Goto, Shinichi; and Ogiro, Kenji, 4,712,149, Cl. 360-132.000.

Ohanessian, Stephen. Garment hanger. 4,711,488, Cl. 297-190.000.

Ohata, Hideo: *See*—
Wakamori, Fumio; Ohata, Hideo; Miyaoka, Shinichiro; and Funabashi, Motohisa, 4,712,182, Cl. 364-507.000.

Ohgoda, Makoto; and Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Apparatus for scanning sheet-shaped recording medium. 4,712,009, Cl. 250-327.200.

Ohira, Tadashi: *See*—
Nishimori, Kadotaro; Yoshida, Keiji; and Ohira, Tadashi, 4,711,569, Cl. 355-69.000.

Ohloff, Gunther: *See*—
Schulte-Elte, Karl-Heinrich; Ohloff, Gunther; Muller, Bernard L.; and Giersch, Wolfgang K., 4,711,875, Cl. 512-1.000.

Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, to Hitachi, Ltd. Method of and apparatus for driving semiconductor laser. 4,712,218, Cl. 372-38.000.

Ohs, Gary L.; and Byers, Timothy W., to Creative Sales & Mfg. Co., Inc. Adjustable support device for vehicle side view mirror. 4,711,538, Cl. 350-604.000.

Ohta, Kazuhisa: *See*—
Kanoh, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, 4,711,289, Cl. 164-34.000.

Ohta, Masao: *See*—
Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, 4,711,872, Cl. 502-328.000.

Ohta, Tomozo; Higashi, Kazutada; and Yamamoto, Hirohiko, to Sharp Kabushiki Kaisha. Antenna system. 4,712,111, Cl. 343-779.000.

Ohu, Russell: *See*—
Gwilliam, Tony S.; and Ohu, Russell, 4,711,062, Cl. 52-646.000.

Ohya, Takeji: *See*—
Maeda, Tatsuo; and Ohya, Takeji, 4,711,052, Cl. 49-502.000.

Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, to Kabushiki Kaisha Toshiba. Washing machine having rotary basket in washing tub. 4,711,105, Cl. 68-23.200.

Ojima, Masahiro: *See*—
Ohnuki, Nobutaka; Ojima, Masahiro; Arimoto, Akira; and Chinone, Naoki, 4,712,218, Cl. 372-38.000.
Saito, Atsushi; Ojima, Masahiro; Maeda, Takeshi; and Kato Tsuyoshi, 4,712,203, Cl. 369-13.000.

Okada, Hiroaki; Ogawa, Yasuaki; and Yashiki, Takatsuka, to Takeda Chemical Industries, Ltd. Prolonged release microcapsules and their production. 4,711,782, Cl. 424-455.000.

Okada, Kazuyoshi: *See*—
Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, 4,712,211, Cl. 370-100.000.

Okamoto, Kenji: *See*—
Oshizawa, Hidekazu; and Okamoto, Kenji, 4,711,211, Cl. 123-357.000.

Okamura, Minoru, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a transfer clutch of a four-wheel drive vehicle. 4,711,333, Cl. 192-0.076.

Okazaki, Atsushi; Igarashi, Masahiko; and Horie, Tsuneo, to Copal Electronics Co., Ltd. Potentiometer. 4,712,084, Cl. 338-184.000.

Okino, Tadashi, to Canon Kabushiki Kaisha. Photometric circuit. 4,711,546, Cl. 354-425.000.

Okita, Tsutomu: *See*—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.

Okiura, Kunio: *See*—
Ishida, Tetsuyoshi; Okiura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, 4,711,828, Cl. 429-12.000.

Okumura, Fumio: *See*—
Kosaka, Takao; Okumura, Fumio; and Tsukahara, Hirokazu, 4,711,749, Cl. 264-4.700.

Okumura Machinery Corporation: *See*—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.

Oleck, Stephen M.: *See*—
Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., 4,711,710, Cl. 208-111.000.

Olin Corporation: *See*—
Pryor, Michael J.; Leedecke, Charles J.; and Masse, Norman G., 4,712,161, Cl. 361-411.000.
Shapiro, Eugene; and Santella, Michael L., 4,711,826, Cl. 428-630.000.
Winter, Joseph; and Pryor, Michael J., 4,711,388, Cl. 228-148.000.

Olin Hunt Specialty Products, Inc.: *See*—
Ferreira, Lawrence, 4,711,836, Cl. 430-326.000.

Oliver, Michael S.: *See*—
Underwood, Lance D.; and Oliver, Michael S., 4,711,311, Cl. 175-340.000.

Olympus Optical Co., Ltd.: *See*—
Saito, Yoshiharu, 4,711,533, Cl. 350-426.000.
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.

Omae, Tsutomu; Obara, Sanshiro; Kubo, Kenji; and Watanabe, Masahiko, to Hitachi, Ltd. Digital servo-control system. 4,712,052, Cl. 318-625.000.

Omi, Shinzo: *See*—
Suka, Motoshi; and Omi, Shinzo, 4,711,938, Cl. 526-88.000.

Omoda, Koichiro: *See*—
Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, 4,712,175, Cl. 364-200.000.

Ondrik, Michael A., to S.I.E., Inc. Pulsed neutron logging method using cumulative count curves. 4,712,007, Cl. 250-270.000.

O'Neill, Mark J., to Entech, Inc. Photovoltaic cell cover for use with a primary optical concentrator in a solar energy collector. 4,711,972, Cl. 136-246.000.

Ono, Akira: *See*—
Inoue, Senya; and Ono, Akira, 4,711,769, Cl. 423-308.000.

Ono, Mitsunori: *See*—
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.

Oohigashi, Masakazu: *See*—
Joyashiki, Hisashi; Iwasawa, Minoru; Oohigashi, Masakazu; and Terai, Masao, 4,710,995, Cl. 15-22.00R.

Ooki, Kenji: *See*—
Ooyama, Kazuo; Ooki, Kenji; and Mizushima, Toshio, 4,711,201, Cl. 123-73.00A.

Oord, Klaas T.: *See*—
Bergsma, Wijtse; and Oord, Klaas T., 4,711,028, Cl. 30-43.600.

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Hasegawa, Shigekazu; Machida, Satoshi; and Oota, Yoshimi, 4,711,329, Cl. 192-3.570.

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Opdahl, Barry J.: *See*—
Shank, Jeffrey B.; Swanson, Steven E.; and Opdahl, Barry J., 4,711,518, Cl. 350-96.200.

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Wright, Harry D.; Hale, John M.; and Weber, Eugen, 4,711,703, Cl. 204-1.00T.

Orcutt, John W., to Texas Instruments Incorporated. Integrated circuit device with textured bar cover. 4,712,129, Cl. 357-84.000.

Orlando, Alfred J., Jr. Electrical connector for tractor-trailer rig. 4,711,510, Cl. 439-246.000.

Orndorff, Karl B.; and Baldwin, Paul L., to Westinghouse Electric Corp. Elevator cab. 4,711,322, Cl. 187-1.00R.

Orr, Avigdor; and Spingler, John O., to DNA Plant Technology Corporation. Prolonging the shelf life of pre-cut fresh celery. 4,711,789, Cl. 426-326.000.

Orsini, Mario: *See*—
Galati, Gaspare; and Orsini, Mario, 4,712,109, Cl. 342-159.000.

Ortho Pharmaceutical Corporation: *See*—
Bandurco, Victor T.; Schwender, Charles F.; Falotico, Robert; and Tobia, Alfonso J., 4,711,883, Cl. 514-253.000.

Osaka Soda Co., Ltd.: *See*—
Miura, Katsuhito; and Nakata, Tetsuya, 4,711,950, Cl. 528-409.000.

Oshima, Kazunori: *See*—
Hatano, Masakatsu; Oshima, Kazunori; Ihara, Tatsuya; and Kiyono, Kenichi, 4,711,867, Cl. 502-205.000.

Oshizawa, Hidekazu; and Okamoto, Kenji, to Diesel Kiki Co., Ltd. Fuel injection apparatus for internal combustion engine. 4,711,211, Cl. 123-357.000.

Osswald, Hartmut: *See*—
Satzinger, Gerhard; Hartenstein, Johannes; Mannhardt, Karl; Kleinschroth, Jurgen; Osswald, Hartmut; Weinheimer, Gunter; and Fritschi, Edgar, 4,711,901, Cl. 514-300.000.

Osterwald, Carl R.; and Emery, Keith A., to United States of America, Energy. Method and apparatus for measuring areas of photoelectric cells and photoelectric cell performance parameters. 4,712,063, Cl. 324-158.00D.

Ostreicher, Eugene A.; Knight, Rodney A.; Fiore, Joseph V.; Emond, George T.; and Hou, Kenneth C., to Cuno Incorporated. Process for charge modifying a microphorous membrane. 4,711,793, Cl. 427-244.000.

Oswald, Alexis A.; and Bhatia, Ram N., to Exxon Research & Engineering Co. Process for the hydrofomylation of sulfur-containing thermally cracked petroleum residua. 4,711,968, Cl. 568-454.000.

Oticon Electronics A/S: *See*—
Lyregaard, Poul E., 4,712,245, Cl. 381-68.600.

O'Toole, Terrence R.: *See*—
Meyer, Thomas J.; O'Toole, Terrence R.; Margerum, Lawrence D.; Westmoreland, T. David; Vining, William J.; Murray, Royce W.; and Sullivan, B. Patrick, 4,711,708, Cl. 204-280.000.

Otsuki, Tatsuo; Shimano, Akio; Aoki, Hiromitsu; and Aoki, Ikuko, to Matsushita Electric Industrial Co., Ltd. Buffered FET logic gate using depletion-mode MESFET's. 4,712,023, Cl. 307-450.000.

Ottestad, Nils T., to Ottestad, Nils T.; and Den Norske Stats Oljeselskap A.S. Double-acting valve system for underwater breathing or the like. 4,711,263, Cl. 137-102.000.

Ouchi, Hiromu: *See—*
Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Syunichiro; and Ouchi, Hiromu, 4,711,862, Cl. 501-136.000.

Oxley, Robert F. Indicator lamps. 4,712,163, Cl. 362-29.000.

Oy Lohja AB: *See—*
Pienimaa, Seppo, 4,711,688, Cl. 156-244.120.

Oy Tampella Ab: *See—*
Hartiala, Eero; Kuusento, Jaakko; and Paasonen, Hannu, 4,711,090, Cl. 60-422.000.

Oy Wartsila AB: *See—*
Niskanen, Heikki, 4,711,405, Cl. 242-66.000.

Oyobe, Kazuo: *See—*
Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, 4,711,990, Cl. 219-552.000.

Ozone, Toshio: *See—*
Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, 4,711,675, Cl. 148-144.000.

Paar, Willibald; Honel, Michael; and Gmoser, Johann, to Vianova Kunstharz, A.G. Self-crosslinking cationic paint binders containing urea groups and process of manufacture. 4,711,934, Cl. 525-452.000.

Paar, Willibald, to Vianova Kunstharz, A.G. Self-crosslinking paint binders and process for their manufacture. 4,711,937, Cl. 525-489.000.

Paar, Willibald: *See—*
Gmoser, Johann; Paar, Willibald; and Honel, Michael, 4,711,935, Cl. 525-452.000.

Paasonen, Hannu: *See—*
Hartiala, Eero; Kuusento, Jaakko; and Paasonen, Hannu, 4,711,090, Cl. 60-422.000.

Pacey, Gilbert E.; and Bubnis, Bernard P., to President and Trustees of the Miami University, The. Method of detecting potassium ions using trifluoromethyl-substituted chromogenic crown ethers. 4,711,853, Cl. 436-74.000.

Paddock, John C.: *See—*
Diederich, David J.; and Paddock, John C., 4,711,429, Cl. 266-44.000.

Pagowski, Stefan J.: *See—*
Brooks, Ralf M.; Connell, Brian P.; Sonnenburg, Dennis T.; and Pagowski, Stefan J., 4,712,113, Cl. 346-1.100.

Pajak, Phillip; Salmons, Victor; and Chan, Tony, to Bally Manufacturing Corporation. Reel mapping scheme for a gaming device. 4,711,451, Cl. 273-143.00R.

Palac, Kazimir: *See—*
Greiner, Siegfried M.; and Palac, Kazimir, 4,712,041, Cl. 313-407.000.

Palitex Project Company GmbH: *See—*
Frentzel-Beyme, Johannes; and Stenmans, Heinz, 4,711,081, Cl. 57-279.000.

Pallini, Joseph W., Jr.; and Milberger, Lionel J., to Vetco Gray Inc. Non-clocking connector with locking anti-rotation tabs. 4,711,471, Cl. 285-81.000.

Pankopf, Bradford. Protective garment for water activities. 4,710,978, Cl. 2-2.10R.

Panoch, Hans J.: *See—*
Mumcu, Salih; Panoch, Hans J.; and Rueter, Joern, 4,711,925, Cl. 524-417.000.

Paper Converting Machine Company: *See—*
Merkatoris, John R., 4,711,683, Cl. 156-164.000.

Partis, Richard A.: *See—*
Mueller, Richard A.; Partis, Richard A.; and Deason, James R., 4,711,903, Cl. 514-381.000.

Pastorino, Ronald L.; and Bock, Lawrence A., to Witco Corporation. New dispersions and the preparation of foamed resins therefrom. 4,711,909, Cl. 521-69.000.

Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A. Method of producing pipes with crack arresters. 4,711,387, Cl. 228-143.000.

Patrick, David H., to Atlantic Richfield Company. Pipe joint seal rings. 4,711,474, Cl. 285-332.300.

Patton, Edward J., to Ahamco Investments, Inc. Insulated concrete form. 4,711,058, Cl. 52-101.000.

Pau, Louis F., to Battelle Memorial Institute. Method of examining and testing an electric device such as an integrated or printed circuit. 4,712,057, Cl. 324-73.00R.

Paul, Albert P.; Szarz, Richard A.; and Card, Roger J., to American Cyanamid Company. Method of manufacturing a bonded particulate article by reacting a hydrolyzed amylaceous product and a heterocyclic compound. 4,711,669, Cl. 106-38.510.

Paules, Eugene H., to United States Tobacco Company. Method of using precision can labeler with optional tax stamp applicator. 4,711,687, Cl. 156-235.000.

Pavlin, Mark S.; and West, James C., to Union Camp Corporation. Aqueous ink composition. 4,711,927, Cl. 524-531.000.

Pawlosky, Anthony J. Saw sharpening apparatus. 4,711,142, Cl. 76-37.000.

Paxton, James R.: *See—*
Jacobs, Alphonse F.; and Paxton, James R., 4,711,294, Cl. 165-19.000.

Pearce, Harold B.; and West, Lynn P., to International Business Machines Corporation. Carrier recovery of modulated signals. 4,712,221, Cl. 375-14.000.

Pegasus Airwave Limited: *See—*
Ford, Victoria L.; and Morgan, Bryan J., 4,711,275, Cl. 141-95.000.

Pellet, Regis J.; and Hinchey, Richard J., to Union Carbide Corporation. Catalytic cracking catalyst. 4,711,864, Cl. 502-65.000.

Pelrine, Bruce P.: *See—*
Chen, Nai Y.; Degnan, Thomas F., Jr.; Leiby, Susan M.; Oleck, Stephen M.; and Pelrine, Bruce P., 4,711,710, Cl. 208-111.000.

Penna, David E., to U.S. Philips Corporation. Display system with nested information display. 4,712,191, Cl. 364-900.000.

Pennsylvania Research Corporation: *See—*
Simkovich, George, 4,711,665, Cl. 75-244.000.

Peppmoller, Reinmar; and Koschier, Friedlieb, to Chemische Fabrik Stockhausen GmbH. Water-soluble polymers plus natural resins sizing agent. 4,711,919, Cl. 524-77.000.

Perfetti, Thomas A.: *See—*
Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., 4,711,255, Cl. 131-330.000.

Perkin-Elmer Corporation, The: *See—*
Shafer, David R., 4,711,535, Cl. 350-442.000.

Perkins, John W.: *See—*
Rimmell, Herbert D.; and Perkins, John W., 4,711,527, Cl. 350-243.000.

Perrone, Nicholas: *See—*
Neubert, Vernon H.; and Perrone, Nicholas, 4,711,424, Cl. 248-636.000.

Persechini, David L.: *See—*
Tangonan, Gregory L.; Yen, Huan-Wun; and Persechini, David L., 4,711,514, Cl. 350-96.120.

Pertzsch, Albert; Zeroni, Ludwig; and Brunner, Hubert, to Agfa Gevaert Aktiengesellschaft. Tape cassette having a lock mechanism for locking a tape protective lid. 4,712,150, Cl. 360-132.000.

Peters, David: *See—*
Denick, John, Jr.; Peters, David; Talwar, Anil K.; and Liao, Wei C., 4,711,774, Cl. 424-48.000.

Peterson, Steven H.; Lahoda, Edward J.; and Weisberg, Sharon L., to Westinghouse Electric Corp. Process for the separation of gadolinium isotopes. 4,711,768, Cl. 423-21.500.

Petit, William A.: *See—*
Aver, John H., Jr.; and Petit, William A., 4,711,418, Cl. 246-5.000.

Petkov, Nedelcho G.: *See—*
Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Veselina B; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.

Petrarch Systems Inc.: *See—*
Arkles, Barry C.; and Brinigar, William S., 4,711,820, Cl. 428-429.000.

Petrofsky, Jerrold S., to Wright State University. Control system for knee joint. 4,711,242, Cl. 128-419.00R.

Petrozzi, Gerard: *See—*
Brison, Bernard; Galerneau, Jacques; Gontier, Alex; and Petrozzi, Gerard, 4,710,980, Cl. 2-50.000.

Peynot, Michel: *See—*
Manoury, Philippe; Obitz, Daniel; and Peynot, Michel, 4,711,892, Cl. 514-336.000.

Pfaff Industriemaschinen GmbH: *See—*
Muller, Richard; Leis, Roland; and Zinssmeister, Axel, 4,711,189, Cl. 112-121.120.

Pfister GmbH: *See—*
Hafner, Hans W., 4,711,127, Cl. 73-302.000.

Pfister, Theodor: *See—*
Kluth, Joachim; Muller, Klaus-Helmut; and Pfister, Theodor, 4,711,959, Cl. 544-320.000.

Pfizer Inc.: *See—*
Campbell, Simon F.; and Kobylecki, Ryszard J., 4,711,882, Cl. 514-228.000.
Walker, Frederick J.; and LaMattina, John L., 4,711,888, Cl. 514-269.000.

Pfundstein, Werner: *See—*
Haller, Andreas; Pfundstein, Werner; and Hall, Heinrich, 4,711,991, Cl. 235-132.00E.

Pharmacia Aktiebolag: *See—*
Axen, Rolf E. A. V.; and Carlsson, Jan P. E., 4,711,951, Cl. 530-323.000.

Pharmacia Aktiebolaget: *See—*
Kronvall, Hans C. G., 4,711,841, Cl. 435-7.000.

Philip, James B., Jr.: *See—*
Grzeskowiak, Nicholas E.; and Philip, James B., Jr., 4,711,838, Cl. 430-568.000.

Phillips, Mark S. Circuit for sequentially turning on lamps on an automobile. 4,712,044, Cl. 315-82.000.

Phillips Petroleum Company: *See—*
Shyr, Yen-Shin; and Johnson, Marvin M., 4,711,868, Cl. 502-235.000.
Yu, Michael C.; and Wright, Roy F., 4,711,796, Cl. 427-185.000.

Pi-Yu, Ou. Outlet valve for toilet tank. 4,710,986, Cl. 4-382.000.

Piccini, Fabrizio: *See—*
Tega, Ezio; Piccini, Fabrizio; Mazzini, Marco; and Magi, Raffaello, 4,711,015, Cl. 29-566.200.

Picker International Inc.: *See—*
Tuy, Heang K.; and Koka, Narasimharao, 4,712,178, Cl. 364-414.000.

Pienimaa, Seppo, to Oy Lohja AB. Method for encapsulating semiconductor components mounted on a carrier tape. 4,711,688, Cl. 156-244.120.

Pienta, Joseph J.: *See—*
Krusas, James J.; and Pienta, Joseph J., 4,711,539, Cl. 351-63.000.

Pierce, Claudia C.; Robinson, Robert S.; and Kneller, James F., to Nalco Chemical Company. Carboxylate N-vinylamide copolymers for internal scale control and passivation in high pressure boiler systems. 4,711,726, Cl. 210-701.000.

Pigeon Corp.: *See*—
Sano, Takashi, 4,711,167, Cl. 99-510.000.
Pigott, John M., to Motorola, Inc. Delay circuit. 4,712,026, Cl. 307-600.000.
Pill, Johannes: *See*—
Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, 4,711,896, Cl. 514-570.000.
Pinckney Molded Plastics, Inc.: *See*—
Kreeger, Elsmer W., 4,711,002, Cl. 24-30.50P.
Piot, Michel: *See*—
Roger, Loic; Maubois, Jean-Louis; Brule, Gerard; and Piot, Michel, 4,711,953, Cl. 530-366.000.
Pitt, Gillies D.; Extance, Philip; and Jones, Roger E., to STC plc. Magnetic field sensors, in particular optical fiber magnetometers. 4,712,065, Cl. 324-244.000.
Pivovarsky, Nikolai B.: *See*—
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.
Player, Kenneth W.: *See*—
Porcello, Sam J.; Manns, James M.; Player, Kenneth W.; and Wilson, Lonny L., 4,711,788, Cl. 426-94.000.
Plotkin, Elliot V.: *See*—
Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., 4,711,245, Cl. 128-635.000.
Plus Development Corporation: *See*—
Moon, William G.; Westwood, Donald C.; and Stone, Thomas R., 4,712,146, Cl. 360-97.000.
Plush, Richard Lee, Jr.: *See*—
Arnce, John W., 4,711,635, Cl. 474-152.000.
Plyler, Robert G.: *See*—
Cross, William E.; Hillestad, Jeanne E.; and Plyler, Robert G., 4,711,509, Cl. 439-587.000.
Poignant, Jean-Claude: *See*—
Wierzbicki, Michel; Hugon, Pierre; and Poignant, Jean-Claude, 4,711,885, Cl. 514-253.000.
Polan, George S.; and Glinecke, Hermann R., to Central Sprinkler Corporation. Portable quick chilling device. 4,711,099, Cl. 62-457.000.
Polaroid Corporation: *See*—
Snitzer, Elias, 4,712,075, Cl. 330-4.300.
Polaschegg, Hans-Dietrich, to Fresenius AG. Apparatus for extracorporeal treatment of blood. 4,711,715, Cl. 210-103.000.
Polosky, Charles T. Book or similar article hanging device. 4,711,419, Cl. 248-225.200.
Pomaibo, Paul: *See*—
Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, 4,711,755, Cl. 376-260.000.
Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, 4,711,759, Cl. 376-284.000.
Popper, Jakhin B., to Popper Technologies (1983) Ltd. Shock and vibration mount. 4,711,423, Cl. 248-635.000.
Popper Technologies (1983) Ltd.: *See*—
Popper, Jakhin B., 4,711,423, Cl. 248-635.000.
Porcello, Sam J.; Manns, James M.; Player, Kenneth W.; and Wilson, Lonny L., to Nabisco Brands. Cookie filler compositions. 4,711,788, Cl. 426-94.000.
Porro, Massimo; and Costantino, Paolo, to Sclavo S.p.A. Glycoproteinic conjugates having trivalent immunogenic activity. 4,711,779, Cl. 424-92.000.
Porter, Daniel A.: *See*—
Fresquez, Meredith L.; Fresquez, Chris J.; and Porter, Daniel A., 4,711,585, Cl. 368-109.000.
Positive Connections, Inc.: *See*—
Fromberg, John P., 4,711,461, Cl. 280-494.000.
Potapov, Jury F.: *See*—
Baldenko, Dmitry F.; Bezlepkin, Nikolai P.; Vadetsky, Jury V.; Gusman, Moisei T.; Potapov, Jury F.; and Semenets, Valery I., 4,711,006, Cl. 29-156.40R.
Pothast, Lambertus A.; Grootentraast, Johannes P.; and Verdonschot, Joannes F. J., to Oce-Nederland B.V. Image-forming apparatus. 4,711,562, Cl. 355-16.000.
Power Modifications Incorporated: *See*—
Grace, Alan G. V., 4,712,170, Cl. 363-98.000.
PPG Industries, Inc.: *See*—
Frank, Robert G.; Claassen, George R.; Waterloo, Thomas L.; Schultz, Stephen J.; and Fecik, Michael T., 4,711,653, Cl. 65-106.000.
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.
Schultz, Stephen J., 4,711,655, Cl. 65-351.000.
Precision Rubber Products Corporation: *See*—
Baker, W. Howard, 4,711,602, Cl. 425-206.000.
Pregnall, Richard A.; and LeGrand, Archie M., Jr., to Westinghouse Electric Corp. Method of measuring moisture in a burnable absorber. 4,711,854, Cl. 436-144.000.
President and Trustees of the Miami University, The: *See*—
Pacey, Gilbert E.; and Bubnis, Bernard P., 4,711,853, Cl. 436-74.000.
Presnyakov, Vladimir I.: *See*—
Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.
Preston, Frank S.: *See*—
Blair, Preston E.; and Preston, Frank S., 4,711,543, Cl. 352-87.000.
Price, Anthony G.; Campbell, Roy; and Green, Andrew P., to Lucas Industries. Self-energizing disc brakes. 4,711,327, Cl. 188-71.400.
Price, Richard P., to Nordson Corporation. Proportional flow control dispensing gun. 4,711,379, Cl. 222-504.000.
Princeton Synergetics, Inc.: *See*—
Greenberg, Joel S., 4,711,994, Cl. 235-384.000.
Procter & Gamble Company, The: *See*—
Gosselink, Eugene P.; and Diehl, Francis L., 4,711,730, Cl. 252-8.750.
Proksha, Georg: *See*—
Berchem, Rutger; and Proksha, Georg, 4,711,503, Cl. 299-79.000.
Pronk, Cornelis: *See*—
van Breda, Jacques; and Pronk, Cornelis, 4,711,704, Cl. 204-28.000.
Prusak, Allan E., to Hayes Industrial Brake, Inc. Light switch and brake line connector assembly. 4,711,092, Cl. 60-534.000.
Pryor, Michael J.; Leedecke, Charles J.; and Masse, Norman G., to Olin Corporation. Hybrid and multi-layer circuitry. 4,712,161, Cl. 361-411.000.
Pryor, Michael J.: *See*—
Winter, Joseph; and Pryor, Michael J., 4,711,388, Cl. 228-148.000.
PSI Star: *See*—
Diederich, Perry A., 4,711,767, Cl. 422-186.290.
Puritscher, Ernst: *See*—
Mugrauer, Hubert; Puritscher, Ernst; and Wittmann, Franz, 4,711,564, Cl. 355-30.000.
Quillfeldt, Winfried; Naumann, Bernd; and Becker-Ross, Helmut, to Jenoptik Jena GmbH. Method and arrangement for multielement analyse. 4,711,572, Cl. 356-311.000.
Quinlan, Charles W.: *See*—
Zarrineghbal, Hossein; and Quinlan, Charles W., 4,711,713, Cl. 208-222.000.
Quiogue, Honesto D., to Hubbell Incorporated. Capacitor hold-down strap. 4,712,162, Cl. 361-417.000.
R. J. Reynolds Tobacco Company: *See*—
Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., 4,711,255, Cl. 131-330.000.
R. T. Vanderbilt Company, Inc.: *See*—
Doe, Lester A., Jr., 4,711,915, Cl. 523-122.000.
Raasch, Hans, to W. Schlafhorst & Co. Method and apparatus for starting up a friction spinning assembly. 4,711,082, Cl. 57-263.000.
Rachi, Masahiro: *See*—
Yoshikawa, Junichi; and Rachi, Masahiro, 4,712,000, Cl. 250-205.000.
Radaelli, Dario; and Giraudi, Walter, to Alfa Romeo Auto S.p.A. Electromagnetic injector for an I.C. engine. 4,711,400, Cl. 239-585.000.
Radisch, Helmer; and Esser, Gunther, to Saint-Gobain Vitrage. Process for treating the surface of a transparent sheet or film having antilacer-ation and self-healing properties and the product made thereby. 4,711,805, Cl. 428-323.000.
Raidel, John E. Suspension system with sway guide. 4,711,465, Cl. 280-712.000.
Rajasekaran, Periagaram K.; Doddington, George R.; and Schalk, Thomas B., to Texas Instruments Incorporated. Speaker-independent word recognizer. 4,712,242, Cl. 381-42.000.
Ramo, Simon: *See*—
Eastlund, Bernard J.; and Ramo, Simon, 4,712,155, Cl. 361-231.000.
Randa, Stuart K., to Du Pont de Nemours, E. I., and Company. Thin wall cover on foamed insulation on wire. 4,711,811, Cl. 428-383.000.
Rank Xerox Limited: *See*—
Tsuruoka, Ryoichi, 4,711,561, Cl. 355-3.00R.
Ransomes Sims & Jefferies PLC: *See*—
Aldred, Edward J., 4,711,072, Cl. 56-6.000.
Rapp, Gilsea, heir: *See*—
Letsche, Ulrich; Rapp, Wolfgang, deceased; Haefner, Guenther; and Tonhaeuser, Wilhelm, 4,711,220, Cl. 123-502.000.
Rapp, Wolfgang, deceased: *See*—
Letsche, Ulrich; Rapp, Wolfgang, deceased; Haefner, Guenther; and Tonhaeuser, Wilhelm, 4,711,220, Cl. 123-502.000.
Rauchle, Kurt: *See*—
von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, 4,711,906, Cl. 514-561.000.
Rawlings, Douglas E.; and Woods, David R., to General Mining Union Corporation, Limited. Construction of selectable shuttle cloning vectors for *Thiobacillus ferrooxidans*. 4,711,849, Cl. 435-91.000.
Rawlings, Kelly R., to Anti-P, Inc. Internal combustion engine pollutant control system. 4,711,222, Cl. 123-555.000.
Raytheon Company: *See*—
Argentini, Dino E., 4,711,859, Cl. 437-209.000.
Faria, Lawrence E.; and Christopher, Earl H., 4,711,650, Cl. 62-6.000.
Razzell, Charles J. H.: *See*—
Van Rumpt, Herman W.; and Razzell, Charles J. H., 4,712,073, Cl. 328-160.000.
RCA Corporation: *See*—
Basile, Philip C., 4,712,020, Cl. 307-256.000.
Casey, Robert F., 4,712,130, Cl. 358-22.000.
Reno, Charles W., 4,712,207, Cl. 369-121.000.
Slattery, Francis R., 4,712,126, Cl. 357-71.000.
Rebound Systems, Inc.: *See*—
Dubner, Robert; Dubner, Russel S.; and Dubner, Todd A., 4,710,985, Cl. 2-425.000.

Rebsamen, Roland, to Reishauer AG. Process and apparatus for controlling the spindle speed of a gear cutting machine. 4,712,048, Cl. 318-85.000.

Regipa, Robert, to Centre National d'Etudes Spatiales (C.N.E.S). Steerable lighter than air balloon. 4,711,416, Cl. 244-31.000.

Rei, Nuno M.; and Wilson, Ronald C., to Morton Thiokol, Inc. Microbiocidal compositions comprising an aryl alkanol and a microbiocidal compound dissolved therein. 4,711,914, Cl. 523-122.000.

REI Technologies, Inc.: *See*—
Zarrineghbal, Hossein; and Quinlan, Charles W., 4,711,713, Cl. 208-222.000.

Reich Spezialmaschinen GmbH: *See*—
Dettelbach, Alfred; and Binder, Werner, 4,711,147, Cl. 83-863.000.

Reichel, Kenneth R.; and Hebrock, Steve, to Audio Technica U.S., Inc. Audible audio level indicator. 4,712,093, Cl. 340-540.000.

Reichenbach, Dean H., to Cummins Engine Company, Inc. Compression braking system for an internal combustion engine. 4,711,210, Cl. 123-321.000.

Reichert-Jung Optische Werke AG: *See*—
Schindl, Klaus P.; Meitz, Franz; and Salzmann, Kurt, 4,711,537, Cl. 350-531.000.

Reifenhauser GmbH & Co.: *See*—
Halter, Hartmut, 4,711,747, Cl. 264-40.200.

Reinhold, Klaus. A method for making a roll for processing a web or strip of material. 4,711,291, Cl. 164-98.000.

Reinten, Hans, to Oce-Nederland B.V. Means and method of symmetrical energization of individual array LED's for image exposure. 4,712,116, Cl. 346-107.00R.

Reishauer AG.: *See*—
Rebsamen, Roland, 4,712,048, Cl. 318-85.000.

Remacle, Roger E. M.; and Verbeeck, Alain A. J., to Labofina, S.A. Treating spent filter media. 4,711,728, Cl. 210-772.000.

Renault, Christian L. A.: *See*—
Dubroeucq, Marie-Christine; Le Fur, Gerard R.; and Renault, Christian L. A., 4,711,890, Cl. 514-311.000.

Rennison, Stuart C.: *See*—
Butters, Alan; Barker, Roger N.; and Rennison, Stuart C., 4,711,834, Cl. 430-201.000.

Reno, Charles W., to RCA Corporation. Apparatus for erasing information on a reversible optical recording medium. 4,712,207, Cl. 369-121.000.

Research Development Corp.: *See*—
Nishizawa, Junichi; and Motoya, Kaoru, 4,712,122, Cl. 357-22.000.

Retallick, William B.: *See*—
Cornelison, Richard C.; and Retallick, William B., 4,711,009, Cl. 29-157.00R.

Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., to O/Y Kyro A/B Tamglass. Support frame for resistor elements in a heating furnace for glass sheets. 4,712,086, Cl. 338-315.000.

Reuss, John R.: *See*—
Franchina, Thomas F.; Gudmundson, Gunnar G.; and Reuss, John R., 4,711,565, Cl. 355-39.000.

Reuter, Alfred, to Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck". Device for shaving the sides of tree trunks. 4,711,279, Cl. 144-39.000.

Rexnord Inc.: *See*—
Hodlewsky, Wasyly G., 4,711,605, Cl. 403-355.000.

Rhone-Poulenc Sante: *See*—
Dubroeucq, Marie-Christine; Le Fur, Gerard R.; and Renault, Christian L. A., 4,711,890, Cl. 514-311.000.

Rialan, Joseph; and Bary, Renate, to Institut Francais du Petrole. Process for controlling the storage of data received by a seismic recording system and a device for implementing same. 4,712,199, Cl. 367-76.000.

Rice, James M.: *See*—
Rice, John E.; Rice, James M.; and Rice, Robert W., 4,712,230, Cl. 379-112.000.

Rice, John E.; Rice, James M.; and Rice, Robert W. Monitoring and recording apparatus for connection to a telephone line. 4,712,230, Cl. 379-112.000.

Rice, Robert W.: *See*—
Rice, John E.; Rice, James M.; and Rice, Robert W., 4,712,230, Cl. 379-112.000.

Richter, Donald L., to Temcor. Large span dome. 4,711,063, Cl. 52-741.000.

Rickmers, Clifford P.; Donovan, Robert D.; and Brickner, Louis C., Jr., to Delta International Machinery Corp. Portable saw mill. 4,711,032, Cl. 30-372.000.

Ricoh Company, Ltd.: *See*—
Kouchiwa, Taira, 4,711,536, Cl. 350-476.000.
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.
Ueda, Yutaka; and Yamamuro, Tetsu, 4,711,798, Cl. 428-65.000.
Yuyama, Yukihiro; Motosugi, Takanori; Honda, Yasuhiro; and Ichikawa, Akira, 4,711,874, Cl. 503-206.000.

Ridoux, Frank E.: *See*—
Neuhalfen, Michael A.; Ridoux, Frank E.; and Edenborough, John S., 4,711,226, Cl. 123-609.000.

Riehl, Roger W., to Machine Technology, Inc. Balancing chuck. 4,711,610, Cl. 409-141.000.

Riethmann, Max: *See*—
Rietzscher, Rolf; Dersch, Stefan; and Riethmann, Max, 4,711,290, Cl. 164-66.100.

Rietzscher, Rolf; Dersch, Stefan; and Riethmann, Max, to George Fischer Ltd. Method and apparatus for casting iron treated with magnesium. 4,711,290, Cl. 164-66.100.

Riggio, Stephen C.: *See*—
Jacobson, Walter; Riggio, Stephen C.; and Turner, James E., 4,711,852, Cl. 436-15.000.

Rigouard, Alain: *See*—
Jamonet, Bernard; Rigouard, Alain; Bouchez, Jean-Pierre; and Duc, Jean, 4,711,721, Cl. 210-607.000.

Rimmell, Herbert D.; and Perkins, John W., to General Motors Corporation. Simulated vehicle lamp. 4,711,527, Cl. 350-243.000.

Ringel, Konrad; and Rudolf, Karl, to Diehl GmbH & Co. Warhead with rotationally-symmetrical hollow charge. 4,711,181, Cl. 102-476.000.

Ringgenberg, Paul D., to Halliburton Company. Multi-mode testing tool and method of testing. 4,711,305, Cl. 166-336.000.

Ringhoff, Hubert: *See*—
Menell, Hans; Ringhoff, Hubert; and Rump, Jurgen, 4,711,691, Cl. 156-415.000.

Rippe, Dondeville M., Jr.; and Scaturro, David T., to Magnum Piering, Inc. Slab jacking process and apparatus. 4,711,603, Cl. 405-230.000.

Risberg, Stig: *See*—
Sundberg, Sten; Risberg, Stig; and Eriksson, Ulf, 4,711,179, Cl. 102-426.000.

Riseman, Jacob: *See*—
Bhatia, Harsaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., 4,712,125, Cl. 357-59.000.

Ritter, G. Thomas; and Budniak, Mitchell, to Abbott Laboratories. Heat source circuitry for biological material analysis. 4,711,987, Cl. 219-358.000.

Ritzer, Josef: *See*—
Brunner, Josef; and Ritzer, Josef, 4,710,999, Cl. 17-65.000.

Roba, Giacomo; and Modone, Eros, to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of producing halide glass, especially for optical communications. 4,711,652, Cl. 65-18.200.

Robert Bosch GmbH: *See*—
Eckardt, Dieter; and Hettich, Gerhard, 4,712,064, Cl. 324-208.000.
Fromme, Georg, 4,712,186, Cl. 364-565.000.
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.
Laufer, Helmut, 4,711,221, Cl. 123-503.000.
Leiber, Heinz, 4,711,266, Cl. 137-554.000.

Roberts, George A.: *See*—
Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., 4,712,078, Cl. 331-99.000.

Roberts, Luther C.: *See*—
Gruenbaum, William T.; Harmon, Julie P.; and Roberts, Luther C., 4,711,832, Cl. 430-106.000.

Robertshaw Controls Company: *See*—
Geary, Frederick J., 4,711,628, Cl. 431-31.000.

Robertson, R. W.: *See*—
Rossborough, Richard F.; and Whitty, Graeme, 4,711,258, Cl. 134-138.000.

Robertson, Warren D.: *See*—
Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, 4,711,672, Cl. 106-281.00R.

Robinson, Robert S.: *See*—
Pierce, Claudia C.; Robinson, Robert S.; and Kneller, James F., 4,711,726, Cl. 210-701.000.

Robinson, Ronald D.: *See*—
Wilmore, Scott H.; and Robinson, Ronald D., 4,710,991, Cl. 5-435.000.

Rockwell International Corporation: *See*—
Christe, Karl O., 4,711,680, Cl. 149-109.400.
Nelson, Blaine J., 4,712,223, Cl. 377-43.000.
Nelson, Blaine J., 4,712,224, Cl. 377-43.000.
Nelson, Blaine J., 4,712,225, Cl. 377-43.000.
Nugier, John G., 4,711,011, Cl. 29-239.000.

Rodgers, E. Walter, to Armor Metals, Inc. Multiple telephone jack slide assembly. 4,712,232, Cl. 379-329.000.

Roe, James: *See*—
Spiel, Albert; Roe, James; and Spanier, Henry C., 4,711,425, Cl. 249-117.000.

Roge, Paul; and Roge, Ralph R. Mailbox signal device. 4,711,391, Cl. 232-35.000.

Roge, Ralph R.: *See*—
Roge, Paul; and Roge, Ralph R., 4,711,391, Cl. 232-35.000.

Roger, Loic; Maubois, Jean-Louis; Brule, Gerard; and Piot, Michel, to Institut De La Recherche Agronomique. Process for obtaining an alpha-lactalbumin enriched product from whey and uses thereof. 4,711,953, Cl. 530-366.000.

Rogier, Serge; and Guigonis, Jacques, to Societe Europeenne des Produits Refractaires. Heat exchangers molded from refractory material. 4,711,298, Cl. 165-165.000.

Rohde, Wolfgang; and Klockner, Jurgen, to SMS Schloemann-Siemag, A.G. Controlling thickness and planarity of hot rolled strips. 4,711,109, Cl. 72-8.000.

Rohde, Wolfgang; and Kolakowski, Manfred, to SMS Schloemann-Siemag AG. Method of and apparatus for the production of wide strip. 4,711,114, Cl. 72-234.000.

Rohm and Haas Co.: *See*—
Amick, David R.; Hann, William M.; and Natoli, John, 4,711,725, Cl. 210-701.000.

Rolls-Royce plc: *See*—
Lyons, Michael R., 4,711,085, Cl. 60-39.141.
Rommel, Reiner; and Landaua, Werner, to Adolf Hottinger Giesserei und Maschinenbau GmbH. Core and shell shooter. 4,711,292, Cl. 164-200.000.
Roodbeen, Leonardus F. H., to Oce-Nederland B.V. Contact fixing device with an improved cleaning mechanism. 4,711,549, Cl. 355-3.0FU.
Roos, Roland: *See*—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,712,148, Cl. 360-132.000.
Roquette Freres Societe Anonyme: *See*—
Gosset, Serge; and Lumaret, Jean-Claude, 4,711,794, Cl. 427-389.900.
Roschmann, Peter; and Simon, Howard E., to U.S. Philips Corporation. R.F. coil system for generating and/or receiving alternating magnetic fields. 4,712,067, Cl. 324-318.000.
Rose, Gerard: *See*—
Marget, Christian; and Rose, Gerard 4,712,153, Cl. 361-91.000.
Rosen, Harold. Compact self-contained fire extinguisher. 4,711,307, Cl. 169-57.000.
Rosenberg, Carol S. Cushioning crutch support covering. 4,711,261, Cl. 135-72.000.
Rosenberg, Peretz. Liquid spraying devices. 4,711,399, Cl. 239-498.000.
Rosman, Matthew: *See*—
Berke, Michael; and Rosman, Matthew, 4,711,230, Cl. 128-69.000.
Ross, John J.: *See*—
Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., 4,711,984, Cl. 219-110.000.
Rossborough, Richard F.; and Whitty, Graeme, to Chapman, M. J.; Sherlock, G. K.; Kilby, J. F.; and Robertson, R. W. Apparatus for cleaning paint roller. 4,711,258, Cl. 134-138.000.
Rostron, Anthony: *See*—
Cowler, David J. W.; and Lewis, Peter R., 4,711,420, Cl. 248-243.000.
Roth, Bernard M.: *See*—
Viannay, Stephane G. J.; Roth, Bernard M.; Mirigay, Solange M. V.; and Chastang, Georges J. B., 4,711,431, Cl. 266-114.000.
Rothfuss, Hans: *See*—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.
Rousseau, Jean: *See*—
Gaudilliere, Bernard; and Rousseau, Jean, 4,711,899, Cl. 514-330.000.
Rovensky, Jozef: *See*—
Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri ; and Rovensky, Jozef, 4,711,952, Cl. 530-327.000.
Rowenta-Werke GmbH: *See*—
Walter, Robert, 4,711,010, Cl. 29-157.00R.
Rozmestor, Raymond L. Socket organizer. 4,711,353, Cl. 206-378.000.
Rudolf, Karl: *See*—
Ringel, Konrad; and Rudolf, Karl, 4,711,181, Cl. 102-476.000.
Rudroff, Wolf-Dietrich. Process for the recovery of valuable substances from lacquer sludge. 4,711,729, Cl. 210-781.000.
Rueter, Joern: *See*—
Mumcu, Salih; Panoch, Hans J.; and Rueter, Joern, 4,711,925, Cl. 524-417.000.
Ruhrechemie Aktiengesellschaft: *See*—
Konkol, Werner; Bahrmann, Helmut; Dambkes, Georg; Gick, Wilhelm; Wiebus, Ernst; and Bach, Hanswilhelm, 4,711,648, Cl. 55-73.000.
Rump, Jurgen: *See*—
Menell, Hans; Ringhoff, Hubert; and Rump, Jurgen, 4,711,691, Cl. 156-415.000.
Runzi, Kurt. Sheet supply apparatus for typewriters, having slewing rollers engaging a platen roll, and method. 4,711,442, Cl. 271-22.000.
Rusconi, David M. Apparatus and method for cold weather protection of large diesel engines. 4,711,204, Cl. 123-142.50R.
Russell, Robert J., to Honeywell Information Systems Inc. Method for making testable electronic assemblies. 4,711,024, Cl. 29-832.000.
Ruston, Robert B., Sr. Variable speed fillet knife. 4,711,030, Cl. 30-272.00A.
Rusu, Radu, to Textron/Auca Corp. Turboprop overspeed protection system. 4,711,615, Cl. 416-46.000.
S. C. Johnson & Son, Inc.: *See*—
Anderson, John J., 4,711,378, Cl. 222-499.000.
Kandathil, Thomas V., 4,711,739, Cl. 252-139.000.
S.I.E., Inc.: *See*—
Ondrik, Michael A., 4,712,007, Cl. 250-270.000.
Saadat, Mohammad M. Device for measuring dimensions of objects. 4,711,037, Cl. 33-520.000.
Saeki, Masaru: *See*—
Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.
Saenko, Vladimir Y.: *See*—
Paton, Boris E.; Medovar, Boris I.; Biletsky, Semen M.; Saenko, Vladimir Y.; Us, Vasiliy I.; Krendeleva, Alisa I.; Barvinko, Jury P.; Medovar, Lev B.; Pivovarsky, Nikolai B.; and Astafiev, Nikolai A., 4,711,387, Cl. 228-143.000.
Sahr, Gladys M.: *See*—
Layne, Richard C., 4,711,059, Cl. 52-173.0DS.
Saint-Gobain Vitrage: *See*—
Radisch, Helmer; and Esser, Gunther, 4,711,805, Cl. 428-323.000.
Saint Ive, Michael H., to Kal, Stephen. Dice pyramid tally board and game. 4,711,453, Cl. 273-268.000.
Saint-Jean, Guy: *See*—
Jeanjean, Robert; Demissy, Daniel; Saint-Jean, Guy; and Landry, Michel, 4,711,978, Cl. 200-148.00A.
Saito, Atsushi; Ojima, Masahiro; Maeda, Takeshi; and Kato Tsuyoshi, to Hitachi, Ltd. Method and apparatus for thermo magnetic recording/erasing information with preselected magnetic field switching. 4,712,203, Cl. 369-13.000.
Saito, Gunji: *See*—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.
Saito, Takashi: *See*—
Hosaka, Masao; and Saito, Takashi, 4,711,560, Cl. 355-14.00C.
Saito, Yoshiharu, to Olympus Optical Co., Ltd. Standard zoom lens system having a large aperture ratio. 4,711,533, Cl. 350-426.000.
Sakaguchi, Hiroaki: *See*—
Aramaki, Minoru; and Sakaguchi, Hiroaki, 4,711,949, Cl. 525-356.000.
Sakai, Mituya: *See*—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.
Sakai, Terumasa: *See*—
Torigoe, Makoto; Suzuki, Akiyoshi; and Sakai, Terumasa, 4,711,568, Cl. 355-68.000.
Sakakibara, Koji; and Haraguchi, Hiroshi, to Nippondenso Co., Ltd. Knock control system for internal combustion engines. 4,711,213, Cl. 123-425.000.
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, to Nippondenso Co., Ltd. Anti-knocking control in internal combustion engine. 4,711,214, Cl. 123-425.000.
Sakakibara, Koji: *See*—
Haraguchi, Hiroshi; and Sakakibara, Koji, 4,711,212, Cl. 123-425.000.
Sakakibara, Yasuyuki: *See*—
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a transfer clutch of a four-wheel drive vehicle. 4,711,317, Cl. 180-197.000.
Sakamoto, Akemi: *See*—
Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, 4,711,873, Cl. 502-344.000.
Sakurai, Yoshihiko, to Diesel Kiki Co., Ltd. Air conditioner system for automobiles. 4,711,295, Cl. 165-22.000.
Salensky, George A., to Union Carbide Corporation. Carboxylic acid-grafted phenoxy resins. 4,711,817, Cl. 428-418.000.
Salensky, George A., to Union Carbide Corporation. Carboxylic acid-grafted phenoxy resins. 4,711,924, Cl. 524-402.000.
Salmons, Victor: *See*—
Pajak, Phillip; Salmons, Victor; and Chan, Tony, 4,711,451, Cl. 273-143.00R.
Salomon S.A.: *See*—
Morell, Joseph; and Demarchi, Jean-Louis, 4,711,042, Cl. 36-50.000.
Salyer, Ival O., to University of Dayton. Polyethylene composites containing a phase change material having a C14 straight chain hydrocarbon. 4,711,813, Cl. 428-402.000.
Salzmann, Kurt: *See*—
Schindl, Klaus P.; Meitz, Franz; and Salzmann, Kurt, 4,711,537, Cl. 350-531.000.
Sambayashi, Takeshi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,711,559, Cl. 355-14.00D.
Samuel, Glenn W. Multiple-unit HVAC energy management system. 4,711,394, Cl. 236-49.000.
Sanchem, Inc.: *See*—
Bibber, John W., 4,711,667, Cl. 106-14.210.
Sanchez, David J. Interactive message garment. 4,710,981, Cl. 2-115.000.
Sander, Wilfried; and Mielke, Siegfried, to Kolbenschmidt AG. Piston for internal combustion engines. 4,711,208, Cl. 123-271.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,711,102, Cl. 68-5.00E.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Wet heat treating apparatus of a cloth for performing dyeing and washing in combination. 4,711,102, Cl. 68-5.00E.
Sanitation Equipment Limited: *See*—
Stewart, John M., 4,710,988, Cl. 4-438.000.
Sanitech, Inc.: *See*—
Nelson, Sidney G., Jr., 4,711,718, Cl. 210-282.000.
Sanner, Axel: *See*—
Sterzel, Hans-Josef; and Sanner, Axel, 4,711,907, Cl. 521-27.000.
Sano, Fumiaki: *See*—
Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, 4,711,617, Cl. 417-295.000.
Sano, Takashi, to Pigeon Corp. Fruit juice squeezer. 4,711,167, Cl. 99-510.000.
Sansotta, Carmelo; and Spector, George. Saw horse. 4,711,319, Cl. 182-155.000.
Santa Barbara Research Center: *See*—
Malek, Fritz J., 4,711,998, Cl. 250-203.00R.
Santel, Hans-Joachim: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.

Santella, Michael L.: *See*—
Shapiro, Eugene; and Santella, Michael L., 4,711,826, Cl. 428-630.000.
Sanyo Electric Co., Ltd.: *See*—
Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamure, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.
Sasaki, Kazuyuki: *See*—
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,540, Cl. 351-214.000.
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,541, Cl. 351-214.000.
Sato, Mitsuo: *See*—
Imanishi, Shozo; and Sato, Mitsuo, 4,711,169, Cl. 100-257.000.
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, to Matsushita Electric Industrial Co., Ltd. Power supply module. 4,712,160, Cl. 361-388.000.
Sato, Yuichi: *See*—
Tsunekawa, Tokuichi; and Sato, Yuichi, 4,712,136, Cl. 358-213.150.
Satoh Seiki Co., Ltd.: *See*—
Yoneda, Katsuki, 4,711,188, Cl. 112-104.000.
Satzinger, Gerhard; Hartenstein, Johannes; Mannhardt, Karl; Kleinschroth, Jurgen; Osswald, Hartmut; Weinheimer, Gunter; and Fritschi, Edgar. 1-6-naphthyridine derivatives useful in the treatment of blood vessel diseases. 4,711,901, Cl. 514-300.000.
Saunders, Jeffrey H.: *See*—
Ansell, Henry G.; and Saunders, Jeffrey H., 4,712,077, Cl. 331-25.000.
Saunders, William J.: *See*—
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,711,374, Cl. 222-129.100.
Savard, Shaunalea: *See*—
Gorter, Helen R.; Moran, Lyle E.; Robertson, Warren D.; and Savard, Shaunalea, 4,711,672, Cl. 106-281.00R.
Savelainen, Matti, to Instrumentarium Corp. RF coil arrangement for NMR examination apparatus. 4,712,068, Cl. 324-318.000.
Savla, Lalit J., to Kollmorgen Technologies Corporation. Floating mask encoder with assembly spacer. 4,712,005, Cl. 250-231.0SE.
Savoly, Arpad: *See*—
Garvey, Christopher M.; Savoly, Arpad; and Weatherford, Thomas M., 4,711,731, Cl. 252-8.514.
Sawamura, Kentaro; Kosaka, Yoshio; and Yamaguchi, Masayasu, to TDK Corporation. Sintered aluminum nitride body and method for making. 4,711,861, Cl. 501-98.000.
Sawamura, Mitsuharu: *See*—
Kikuchi, Kazuhiko; Honguu, Kazuoki; and Sawamura, Mitsuharu, 4,711,821, Cl. 428-457.000.
Scahill, Steven. Utility connection bar. 4,711,470, Cl. 285-30.000.
Scala, Luciano C.: *See*—
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.
Scarpelli, August F.: *See*—
Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., 4,711,984, Cl. 219-110.000.
Scaturro, David T.: *See*—
Rippe, Dondeville M., Jr.; and Scaturro, David T., 4,711,603, Cl. 405-230.000.
Schaaf, Cecil; and Schaaf, Craig. Beach erosion control device. 4,711,598, Cl. 405-30.000.
Schaaf, Craig: *See*—
Schaaf, Cecil; and Schaaf, Craig, 4,711,598, Cl. 405-30.000.
Schachet, Eli: *See*—
Leigh, Harold G.; and Schachet, Eli, 4,711,637, Cl. 604-220.000.
Schaefer, Daniel W.: *See*—
Freier, Edward, Jr.; and Schaefer, Daniel W., 4,711,073, Cl. 56-13.300.
Schafer, Curtiss R., to Cortronix, Inc. Cortical hearing aid. 4,711,243, Cl. 128-420.500.
Schaffner, Hanspeter, to Gebruder Buhler AG. Pellet mill. 4,711,622, Cl. 425-331.000.
Schaible, Siegfried; Hohlwegler, Heinz; and Kohl, Bernhard, to Klockner-Humboldt-Deutz AG. Baler and process for making bales or for operating the baler. 4,711,078, Cl. 56-341.000.
Schalk, Thomas B.: *See*—
Rajasekaran, Periagaram K.; Doddington, George R.; and Schalk, Thomas B., 4,712,242, Cl. 381-42.000.
Schallner, Otto: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.
Schatz, Klaus W., to Mobil Oil Corporation. Closed cyclone FCC system with provisions for surge capacity. 4,711,712, Cl. 208-153.000.
Schenkel, David P.: *See*—
Warwick, Alastair A.; Schenkel, David P.; and Ng, Kenny Y., 4,712,213, Cl. 371-15.000.
Schering Aktiengesellschaft: *See*—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
Scherrer, Fernand. False ceiling or false wall constituted by a stretched sheet fastened. 4,711,060, Cl. 52-222.000.
Scherrer, Fernand. Spotlight bracket for a false ceiling or a false wall. 4,712,168, Cl. 362-427.000.
Schetina, Otto: *See*—
Barnthaler, Franz; Bedenk, Ferdinand; Schetina, Otto; and Zitz, Alfred, 4,711,502, Cl. 299-33.000.
Schiller, Helmut, to Linde Aktiengesellschaft. Process and apparatus for cooling a gaseous stream before and/or during its compression. 4,711,771, Cl. 423-359.000.
Schindl, Klaus P.; Meitz, Franz; and Salzmann, Kurt, to Reichert-Jung Optische Werke AG. Stage for a microscope. 4,711,537, Cl. 350-531.000.
Schluger, Allen. Container for product samples. 4,711,348, Cl. 206-45.290.
Schlumberger Electronics, Inc.: *See*—
Cosser, Harry F., 4,711,117, Cl. 73-1.00H.
Schlumberger Technology Corporation: *See*—
Clark, Brian; and Chew, Weng C., 4,712,070, Cl. 324-338.000.
Schmid, Franz: *See*—
von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, 4,711,906, Cl. 514-561.000.
Schmidt, Edward D., to E.D.S. Company. High fiber bread and extruded products. 4,711,786, Cl. 426-19.000.
Schmidt, Oskar, to Lim Kunststoff Technologie Gesellschaft m.b.H. Pneumatic tire. 4,711,284, Cl. 152-452.000.
Schmidt, Phillip A., to Weyerhaeuser Company. Vertical flail delimber. 4,711,280, Cl. 144-208.00J.
Schmidt, Robert R.: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Klaus, 4,711,658, Cl. 71-92.000.
Schmittbetz, Klaus, to Kloeckner-Humboldt-Deutz AG. Mounted implement hitch for farm tractors. 4,711,460, Cl. 280-460.00A.
Schmitz, Beat: *See*—
Stahl, Peter H.; and Schmitz, Beat, 4,711,880, Cl. 514-108.000.
Schmitz, Steven R.: *See*—
Davis, Loren G.; Schmitz, Steven R.; and Tauer, Dennis L., 4,712,210, Cl. 370-77.000.
Schneider, Eugene: *See*—
Kessel, Michael; Kessel, Erwin; and Schneider, Eugene, 4,711,281, Cl. 144-256.100.
Schnell, Kenneth R., to Hubbell Incorporated. Connector for non-metallic conduit. 4,711,472, Cl. 285-162.000.
Schnerk, Thomas G., to TRW Inc. Transmission and reception of television broadcast in high-fidelity stereo audio. 4,712,240, Cl. 387-3.000.
Schobert, Frank: *See*—
Mesun, Randy O.; and Schobert, Frank, 4,710,987, Cl. 4-420.000.
Schoenberg, Andrew J.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,711,026, Cl. 29-850.000.
Schomann, Klaus D.: *See*—
Balz, Werner; Muenzner, Wulf; Schomann, Klaus D.; Berger, Heinz; and Roos, Roland, 4,712,148, Cl. 360-132.000.
Schomblond, Jacques, to Cartier Industrie. Injection molds intended for the production of composite bodies such as multicolored light covers or components made of several different materials. 4,711,621, Cl. 425-120.000.
Schonenberger, Guido: *See*—
Mader, Karl; Schonenberger, Guido; and Buzzi, Carlo A., 4,711,375, Cl. 222-135.000.
Schoofs, Franciscus A. C. M.; Bierhoff, Martinus P. M.; Van Mil, Job F. P.; and Slomp, Albert H., to U.S. Philips Corporation. Digital/analog converter having a switchable reference current. 4,712,091, Cl. 340-347.0DA.
Schott, Heinrich, to Siemens Aktiengesellschaft. Signalling circuit. 4,712,056, Cl. 323-315.000.
Schrenk, Hartmut, to Siemens Aktiengesellschaft. Circuit for a cord carrier having a memory and an access control unit for secure data access. 4,712,177, Cl. 364-200.000.
Schroder, Joris, to Inventio AG. Service indicating device for elevators. 4,711,324, Cl. 187-135.000.
Schroeder, Gertrud: *See*—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.
Schrom, Ralf-H.; and Baltes, Horst, to General Motors Corporation. Mounting or locking assembly, especially for use with pivotable motor vehicle seats. 4,711,493, Cl. 297-379.000.
Schulte-Elte, Karl-Heinrich; Ohloff, Gunther; Muller, Bernard L.; and Giersch, Wolfgang K., to Firmenich SA. Composition essentially consisting of trans-1-(2,6,6-trimethylcyclohexyl)-hexan-3-ol. 4,711,875, Cl. 512-1.000.
Schulte, Susan M.: *See*—
Kwon, Young J.; and Schulte, Susan M., 4,711,664, Cl. 75-84.500.
Schultz, Daryl. Fertilizer applicator knife and its use. 4,711,187, Cl. 111-7.000.
Schultz, Stephen J., to PPG Industries, Inc. Adjustable quench for tempering a glass sheet. 4,711,655, Cl. 65-351.000.
Schultz, Stephen J.: *See*—
Frank, Robert G.; Claassen, George R.; Waterloo, Thomas L.; Schultz, Stephen J.; and Fecik, Michael T., 4,711,653, Cl. 65-106.000.
Schulze, Martin: *See*—
Spanton, David J.; and Schulze, Martin, 4,711,500, Cl. 298-17.00S.
Schuman, Mark. Radiant emission and absorption multigas analyzer. 4,711,571, Cl. 356-311.000.

Schuster, Joachim: *See*—
Genschow, Henning; Heisel, Uwe; and Schuster, Joachim, 4,711,016, Cl. 29-568.000.

Schuster, Max, to Zahnradfabrik Friedrichshafen AG. Drive connection with a freewheel mechanism. 4,711,332, Cl. 192-48.920.

Schwab, Carl, to ISC Cardion Electronics, Inc. Method and apparatus for detecting microbursts. 4,712,108, Cl. 342-26.000.

Schwabe GmbH: *See*—
Albeck, Bernhard; and Goedicke, Siegfried, 4,711,019, Cl. 29-609.000.

Schwartz, Nathan G., to Techniservice. Monofilament-wrap texturizing method and product. 4,711,191, Cl. 112-410.000.

Schwartz, Ronald E.: *See*—
Bilge, Umit; Scarpelli, August F.; Schwartz, Ronald E.; and Ross, John J., 4,711,984, Cl. 219-110.000.

Schwelm, Hans, to Hydrolux S.a.r.l. Hydraulic control block. 4,711,267, Cl. 137-596.150.

Schwender, Charles F.: *See*—
Bandurco, Victor T.; Schwender, Charles F.; Falotico, Robert; and Tobia, Alfonso J., 4,711,883, Cl. 514-253.000.

Sclavo S.p.A.: *See*—
Porro, Massimo; and Costantino, Paolo, 4,711,779, Cl. 424-92.000.

Scotese, Michael J.: *See*—
Erker, James W.; Scotese, Michael J.; and Stotts, Jay B., 4,711,614, Cl. 414-641.000.

Scott, John J., to Norton Company. Abrasive casting process. 4,711,750, Cl. 264-144.000.

Scott, William A.; and Dull, Carl, to Tillotson, Ltd. Starting aid for small internal combustion engines. 4,711,744, Cl. 261-64.400.

Scowen, Reginald V.: *See*—
Carter, Malcolm N. A.; and Scowen, Reginald V., 4,711,740, Cl. 252-174.240.

Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, to Westinghouse Electric Corp. Handling tool for, and method of use of, ice basket removable cruciform. 4,711,755, Cl. 376-260.000.

Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, to Westinghouse Electric Corp. Removable cruciform for ice condenser ice basket. 4,711,759, Cl. 376-284.000.

Scriven, Roger L.: *See*—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.

Seefluth, U. Christian, to Sita Baulemente GmbH. Drill tool. 4,711,609, Cl. 408-68.000.

Seibu Polymer Kasei Kabushiki Kaisha: *See*—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.

Seidl, Jiri, to Bayerische Motoren Werke AG. Timing case for a cylinder head of internal combustion engines having gas changing valves arranged essentially in parallel to one another. 4,711,203, Cl. 123-90.340.

Seikosha Co., Ltd.: *See*—
Kizawa, Hiroyuki, 4,711,586, Cl. 368-232.000.

Sekine, Kazumi, to Canon Kabushiki Kaisha. Electronic instrument. 4,711,992, Cl. 235-145.00R.

Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Galati, Gaspare; and Orsini, Mario, 4,712,109, Cl. 342-159.000.

Semenets, Valery I.: *See*—
Baldenko, Dmitry F.; Bezlepkin, Nikolai P.; Vadetsky, Jury V.; Gusman, Moisei T.; Potapov, Jury F.; and Semenets, Valery I., 4,711,006, Cl. 29-156.40R.

Serafin, Frank G., to W. R. Grace & Co. Method of grinding a hydraulic cement. 4,711,401, Cl. 241-16.000.

Serno, Peter, to Bayer Aktiengesellschaft. Medicament formulation. 4,711,902, Cl. 514-356.000.

Seshadri, Jayaram: *See*—
Howland, Leland L.; and Seshadri, Jayaram, 4,711,095, Cl. 62-117.000.

Seth, Pyare L.: *See*—
von Stetten, Otto; Seth, Pyare L.; Schmid, Franz; and Rauchle, Kurt, 4,711,906, Cl. 514-561.000.

Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, to Canon Kabushiki Kaisha. Laser beam printer. 4,712,118, Cl. 346-108.000.

Seyfried, Christoph: *See*—
Hausberg, Hans-Heinrich; Bottcher, Henning; Seyfried, Christoph; and Bergmann, Rolf, 4,711,893, Cl. 514-339.000.

SF-Vollverbundstein-Kooperation GmbH: *See*—
Leling, Menno; and Hagenah, Gerhard, 4,711,606, Cl. 405-286.000.

S+G Implants GmbH: *See*—
Grundei, Hans, 4,711,639, Cl. 623-20.000.

SGS-Antes Componenti Elettronici S.p.A.: *See*—
Marchisi, Giuseppe; and Cognetti De Martiis, Carlo, 4,711,023, Cl. 29-827.000.

SGS-ATES Componenti Elettronici SpA: *See*—
Colombo, Piero; Cellai, Marino; and Cognetti de Martiis, Carlo, 4,712,127, Cl. 357-72.000.

Shadbolt, Peter J.: *See*—
Chen, Te H.; Cicchino, Dominic; and Shadbolt, Peter J., 4,711,186, Cl. 110-336.000.

Shafer, David R., to Perkin-Elmer Corporation, The. Ring field projection system. 4,711,535, Cl. 350-442.000.

Shah, Manoj R.; and Lenz, Henry G., to General Electric Company. Acyclic generator with liquid metal current collectors having circulating current barriers. 4,712,033, Cl. 310-178.000.

Shank, Jeffrey B.; Swanson, Steven E.; and Opdahl, Barry J., to GTE Products Corporation. Fiber optic connector. 4,711,518, Cl. 350-96.200.

Shapiro, Eugene; and Santella, Michael L., to Olin Corporation. Iron-nickel alloys having improved glass sealing properties. 4,711,826, Cl. 428-630.000.

Sharma, Shanmuk; Hill, Donnie K.; and Durr, Charles A., to M. W. Kellogg Company, The. Process for separation of hydrocarbon gases. 4,711,651, Cl. 62-34.000.

Sharp Kabushiki Kaisha: *See*—
Iida, Hiroyuki; Murakami, Haruhiko; Matsumoto, Tsuyoshi; and Kashihara, Junzo, 4,711,313, Cl. 177-127.000.
Ohta, Tomozo; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,712,111, Cl. 343-779.000.
Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,712,219, Cl. 372-45.000.

Sharpee, Richard L.: *See*—
Bass, Edmund P.; and Sharpee, Richard L., 4,711,778, Cl. 424-89.000.

Shell Oil Company: *See*—
Koeling, Thijs; Lehr, Bernd C.; and Broekhuizen, Willem, 4,711,303, Cl. 166-250.000.
Korcz, William H.; and Singhal, Surendra N., 4,711,362, Cl. 220-67.000.
Zemel, Bernard; and Closmann, Philip J., 4,712,006, Cl. 250-269.000.

Shepherd, Roger D.: *See*—
Nilsson, Ben A.; and Shepherd, Roger D., 4,711,552, Cl. 355-3.00R.

Sherlock, G. K.: *See*—
Rossborough, Richard F.; and Whitty, Graeme, 4,711,258, Cl. 134-138.000.

Sherwin, Maynard A.; and Koleske, Joseph V., to Union Carbide Corporation. Humidity resistant coating employing branched polymers of t-butyl acrylate. 4,711,944, Cl. 526-318.420.

Shibanai, Ichiro; and Nakamura, Kenji, to Japan Liquid Crystal Co., Ltd. Curing agent for epoxy resin and method for curing epoxy resin. 4,711,936, Cl. 525-485.000.

Shibazaki, Toshimi; and Nakayama, Teruo, to Murata Kikai Kabushiki Kaisha. Spun yarn and method and apparatus for forming spun yarn. 4,711,080, Cl. 57-207.000.

Shiga, Tatsuhide: *See*—
Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, 4,712,173, Cl. 364-138.000.

Shigeta, Yuko: *See*—
Ando, Hirohito; Takada, Zenji; and Shigeta, Yuko, 4,711,674, Cl. 106-289.000.

Shiina, Haruo, to Honda Giken Kogyo Kabushiki Kaisha. High strength structural member made of Al-alloy. 4,711,823, Cl. 428-547.000.

Shikata, Nobuo: *See*—
Kikuchi, Kaoru; and Shikata, Nobuo, 4,711,707, Cl. 204-145.00R.

Shim, Hyun J. Roller skate. 4,711,458, Cl. 280-11.220.

Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, to Ricoh Company, Ltd. Aqueous ink composition. 4,711,668, Cl. 106-22.000.

Shimada, Susumu: *See*—
Katou, Yukio; Suzuki, Takehiro; and Shimada, Susumu, 4,711,316, Cl. 180-168.000.

Shimano, Akio: *See*—
Otsuki, Tatsuo; Shimano, Akio; Aoki, Hiromitsu; and Aoki, Ikuko, 4,712,023, Cl. 307-450.000.

Shimazu, Toshikazu: *See*—
Kawaguchi, Fumiaki; Shimazu, Toshikazu; and Takahashi, Kazuhisa, 4,712,117, Cl. 346-108.000.

Shimura, Yoshiharu: *See*—
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamure, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.

Shinchi, Takashi: *See*—
Kano, Hidekazu; Shinchi, Takashi; and Hosoi, Shuichi, 4,711,217, Cl. 123-491.000.

Shinkai, Yasuo: *See*—
Kazaoka, Kenichi; Wakamatsu, Fumio; and Shinkai, Yasuo, 4,711,497, Cl. 297-458.000.

Shinmura, Yoshinori: *See*—
Tsujiuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, 4,711,054, Cl. 51-165.770.

Shintani, Takeshi: *See*—
Iri, Eiji; Kaneko, Takashi; Shintani, Takeshi; Mio, Kotaro; and Ijiri, Yasuo, 4,711,523, Cl. 350-96.230.

Shiring, Francis J., III: *See*—
Cullo, Leonard A.; and Shiring, Francis J., III, 4,711,869, Cl. 502-239.000.

Shiroshita, Osamu; Ishiguro, Yasuo; and Itou, Yoshizumi, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Toyota Jidosha Kabushiki Kaisha. Tracking robot apparatus. 4,712,183, Cl. 364-513.000.

Shishido, Tadao: *See*—
Inagaki, Yoshio; and Shishido, Tadao, 4,711,963, Cl. 548-365.000.

Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, to Olympus Optical Co., Ltd. Apparatus for photometrically detecting an optically focused condition of an optical system. 4,711,999, Cl. 250-204.000.

Shoji, Masaru: *See*—
Tanazawa, Masayoshi; Shoji, Masaru; and Yamada, Wataru, 4,711,584, Cl. 368-88.000.
Shupert, Kristine A.: *See*—
Bull, Rebecca L.; and Shupert, Kristine A., 4,710,979, Cl. 2-48.000.
Shure Brothers, Inc.: *See*—
Julstrom, Stephen D., 4,712,231, Cl. 379-202.000.
Shutt, Sidney G. Hydrofoil apparatus. 4,711,195, Cl. 114-274.000.
Shyr, Yen-Shin; and Johnson, Marvin M., to Phillips Petroleum Company. Process for preparing silica-alumina. 4,711,868, Cl. 502-235.000.
Siemens Aktiengesellschaft: *See*—
Horbaschek, Heinz, 4,712,226, Cl. 378-134.000.
Luft, Johann, 4,712,220, Cl. 372-50.000.
Mugrauer, Hubert; Puritscher, Ernst; and Wittmann, Franz, 4,711,564, Cl. 355-30.000.
Narjes, Ferdinand, 4,711,976, Cl. 178-2.00C.
Schott, Heinrich, 4,712,056, Cl. 323-315.000.
Schrenk, Hartmut, 4,712,177, Cl. 364-200.000.
Warden, Hans-Erik, 4,712,227, Cl. 378-173.000.
Zwicker, Eberhard; Beckenbauer, Thomas; and Beer, Guenther, 4,712,244, Cl. 381-68.100.
Siemon Company, The: *See*—
Below, Randy; Burke, Howard; and Thomas, Stephen M., 4,712,234, Cl. 379-399.000.
Sigma Instruments, Inc.: *See*—
Horber, Ralph W., 4,712,028, Cl. 310-49.00R.
Sigma Tool & Machine Limited: *See*—
Leistner, Walter H., 4,711,980, Cl. 219-56.000.
Silbernagel, Peter, to B. Hagemann & Co. Stretch foil wrapping arrangement. 4,711,069, Cl. 53-556.000.
Sillony Company Limited: *See*—
Fujiyama, Seiki; and Lee, Myonghi, 4,712,180, Cl. 364-419.000.
Siltronics Ltd.: *See*—
Carr, Francis, 4,712,112, Cl. 343-788.000.
Simkovich, George, to Pennsylvania Research Corporation. Oxidation resistant alloy. 4,711,665, Cl. 75-244.000.
Simm, Wolfgang: *See*—
Oeschsle, Manfred; Szieslo, Uwe; Streb, Karl-Peter; and Simm, Wolfgang, 4,711,627, Cl. 431-30.000.
Simmonds Precision Products, Inc.: *See*—
Spillman, William B., Jr., 4,712,004, Cl. 250-227.000.
Simon, Howard E.: *See*—
Roschmann, Peter; and Simon, Howard E., 4,712,067, Cl. 324-318.000.
Simonazzi, Adriano. Filling device with interchangeable valve member for cans of different diameters. 4,711,276, Cl. 141-286.000.
Simons, Leon. Tamper proof package with electrical circuit. 4,711,368, Cl. 220-450.000.
Simons, Robert: *See*—
Frezza, William; Simons, Robert; and Westerfer, Richard, 4,712,239, Cl. 380-20.000.
Simonson, Dale E.; and Stoll, Donald H., to General Electric Company. Stud mounted non-metallic electric enclosure. 4,712,157, Cl. 361-357.000.
Simplicity Manufacturing, Inc.: *See*—
Freier, Edward, Jr.; and Schaefer, Daniel W., 4,711,073, Cl. 56-13.300.
Singer Company, The: *See*—
Houser, John, Jr., 4,712,055, Cl. 320-35.000.
Singh, Gurvinder P.: *See*—
Kwun, Hegeon; Birring, Anmol S.; Singh, Gurvinder P.; Hendrix, Gary J.; and Alcazar, David G., 4,711,120, Cl. 73-119.00R.
Singhal, Anil K., to IMRE Corporation. Immune complex assay. 4,711,839, Cl. 435-4.000.
Singhal, Surendra N.: *See*—
Korcz, William H.; and Singhal, Surendra N., 4,711,362, Cl. 220-67.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 2,4-dihalogenobenzoyl-(thio)urea insecticides. 4,711,905, Cl. 514-522.000.
Sita Baulemente GmbH: *See*—
Seefluth, U. Christian, 4,711,609, Cl. 408-68.000.
Skeels, Gary W.; and Breck, Donald W., deceased (by Breck, Stephen R., George D. Breck, heirs), to Union Carbide Corporation. Silicon substituted Y zeolite composition LZ-210. 4,711,770, Cl. 423-328.000.
Slattery, Francis R., to RCA Corporation. Low resistance tunnel. 4,712,126, Cl. 357-71.000.
Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., to United States of America, Air Force. Dielectric resonator oscillators with digital temperature compensation. 4,712,078, Cl. 331-99.000.
Slomp, Albert H.: *See*—
Schoofs, Franciscus A. C. M.; Bierhoff, Martinus P. M.; Van Mil, Job F. P.; and Slomp, Albert H., 4,712,091, Cl. 340-347.0DA.
Small, Maynard E. Bingo game involving promotional coupons. 4,711,454, Cl. 273-269.000.
Smid, Albert; Greve, Peter F.; and 't Lam, Hendrik, to U.S. Philips Corporation. Opto-electronic focussing-error detection system with a compound wedge beam splitter. 4,712,205, Cl. 369-45.000.
Smith, David E.: *See*—
Matthews, Kenneth B.; Beckett, Christine A.; Smith, David E.; and Davidson, Richard R., 4,711,727, Cl. 210-727.000.
Smith International, Inc.: *See*—
Underwood, Lance D.; and Oliver, Michael S., 4,711,311, Cl. 175-340.000.
Smith, Jack E., to General Motors Corporation. Decoratively stitched trim part and method. 4,711,190, Cl. 112-266.200.
Smith, Robert K.: *See*—
Butler, Scott J.; Smith, Robert K.; and Abdollahian, Mehdy, 4,712,046, Cl. 315-248.000.
Smith, Vinson C.: *See*—
Lockett, Michael J.; Summers, Daniel R.; Smith, Vinson C.; and Upchurch, James C., 4,711,745, Cl. 261-114.200.
SmithKline Beckman Corporation: *See*—
Lindsey, Thomas O.; and Zavy, Michael T., 4,711,897, Cl. 514-665.000.
Moore, Michael L., 4,711,877, Cl. 514-11.000.
Smithwrick, John H.: *See*—
Glasser, George M.; DeRobertis, Robert P.; Smithwrick, John H.; and Kelly, William J., 4,711,979, Cl. 219-10.55D.
Smolnik, John. Mortar training device with functional simulated propelling charges. 4,711,180, Cl. 102-445.000.
SMS Schloemann-Siemag AG: *See*—
Bald, Wilfried, 4,711,116, Cl. 72-366.000.
Rohde, Wolfgang; and Kolakowski, Manfred, 4,711,114, Cl. 72-234.000.
SMS Schloemann-Siemag, A.G.: *See*—
Rohde, Wolfgang; and Klockner, Jurgen, 4,711,109, Cl. 72-8.000.
Smulders, Henricus W. W., to U.S. Philips Corporation. Assembly including an optical fiber secured in a wall. 4,711,519, Cl. 350-96.200.
Snider, Scott C.; and DeLeon, Alberto, to Celotex Corporation, The. Polyisocyanurate foams from digestion products of polyalkylene terephthalate polymers and polyols. 4,711,912, Cl. 521-125.000.
Snitzer, Elias, to Polaroid Corporation. Optical amplifier. 4,712,075, Cl. 330-4.300.
Snitzer, Elias: *See*—
Morey, William W.; and Snitzer, Elias, 4,711,524, Cl. 350-96.250.
Snyder, Donald Q., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Apparatus for end finishing a lightguide fiber termination. 4,711,053, Cl. 51-3.000.
Soca, Serge, to Thomson Video Equipment. Device and method for reducing the amplitude range of signals representing an image. 4,712,132, Cl. 358-37.000.
Societe Europeen de Propulsion: *See*—
Vives, Michel; and Buttazzoni, Bernard, 4,711,234, Cl. 128-92.0YF.
Societe Europeenne des Produits Refractaires: *See*—
Rogier, Serge; and Guigonis, Jacques, 4,711,298, Cl. 165-165.000.
Societe Francaise d'Equipements pour la Aerienne (S.F.E.N.A.): *See*—
Boura, Andre , 4,711,128, Cl. 73-517.00B.
Sola U.S.A. Inc.: *See*—
Harvey, Thomas B., III, 4,711,943, Cl. 526-279.000.
Somerset, John B., to McPherson's Limited. Cookery implement. 4,711,029, Cl. 30-148.000.
Sonnenburg, Dennis T.: *See*—
Brooks, Ralf M.; Connell, Brian P.; Sonnenburg, Dennis T.; and Pagowski, Stefan J., 4,712,113, Cl. 346-1.100.
Sony Corporation: *See*—
Kawakami, Hiroshi; and Ishizaka, Kazuo, 4,712,143, Cl. 358-311.000.
Maeda, Satoru, 4,712,099, Cl. 340-703.000.
Tamura, Eiji, 4,712,187, Cl. 364-571.000.
Sood, Lal C., to Motorola, Inc. High speed equalization in a memory. 4,712,197, Cl. 365-230.000.
Sorenson, Blaine: *See*—
Frazier, Stanley J.; and Sorenson, Blaine, 4,711,282, Cl. 182-106.000.
Sorochenko, Oleg A.; and Kondratiev, Igor F. Electrosurgical instrument. 4,711,239, Cl. 128-303.140.
Sound Sender, Inc.: *See*—
Michels, Dennis; Howe, Geoff; and Joseph, Douglas, 4,712,250, Cl. 455-20.000.
Spangler, Glenn E.: *See*—
Vora, Kishore N.; Carrico, John P., Sr.; Spangler, Glenn E.; Campbell, Donald N.; and Martin, Charles E., 4,712,008, Cl. 250-287.000.
Spanier, Henry C.: *See*—
Spiel, Albert; Roe, James; and Spanier, Henry C., 4,711,425, Cl. 249-117.000.
Spanton, David J.; and Schulze, Martin. Stabilizing apparatus for a dump vehicle. 4,711,500, Cl. 298-17.00S.
Speca, Anthony N., to Exxon Chemical Patents Inc. Olefin polymerization catalysts, production and use. 4,711,865, Cl. 502-116.000.
Specht, Dieter, to Interroll Fordertechnik GmbH & Co. KG. Apparatus for documentless order picking of goods. 4,711,045, Cl. 40-564.000.
Spector, George: *See*—
Fleisher, Nathaniel; and Spector, George, 4,711,254, Cl. 131-189.000.
Sansotta, Carmelo; and Spector, George, 4,711,319, Cl. 182-155.000.
Spelsberg, Thomas C., to Mayo Medical Resources. Nuclear binding assay for steroid receptor functionality in cancerous cells. 4,711,856, Cl. 436-504.000.
Speranza, Donald, to Eaton Corporation. Method for controlling AMT system including after transmission gear change clutch and fuel control. 4,711,141, Cl. 74-866.000.
Sperry Corporation: *See*—
Labrum, Joseph H., 4,712,059, Cl. 324-77.00K.
McGuire, Charles F.; Weber, David J.; and Steyaert, Gordon C., 4,712,024, Cl. 307-529.000.
Weindorf, Paul F. L., 4,712,047, Cl. 315-397.000.

Spiel, Albert; Roe, James; and Spanier, Henry C., to Nabisco Brands, Inc. Rotary molding system. 4,711,425, Cl. 249-117.000.

Spillman, William B., Jr., to Simmonds Precision Products, Inc. Method and apparatus for compensating fiber optic lead and connector losses in a fiber optic sensor by using a broadband optical source and multiple wave retardation. 4,712,004, Cl. 250-227.000.

Spingler, John O.: *See*—
Orr, Avigdor; and Spingler, John O., 4,711,789, Cl. 426-326.000.

Spiro America Inc.: *See*—
Castricum, Wilhelmus P. H., 4,711,110, Cl. 72-49.000.

Spitzenberger, Kurt: *See*—
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.

SPOFA, spojene podniky pro zdravotnickouvyrobu: *See*—
Kasafirek, Evzen; Cerny, Martin; Kocis, Petr; Krepelka, Jiri ; and Rovensky, Jozef, 4,711,952, Cl. 530-327.000.

Sporing, Jorg: *See*—
Oechslin, Ludwig; Giger, Urs; and Sporing, Jorg, 4,711,583, Cl. 368-16.000.

Spring, Robert J.: *See*—
Caldwell, Donald B.; and Spring, Robert J., 4,711,299, Cl. 166-105.100.

Square D Company: *See*—
Dvorak, Robert F., 4,712,151, Cl. 361-47.000.

Staerzl, Richard E., to Brunswick Corporation. Throttle-position signal generator for an electronic fuel-injection system. 4,711,219, Cl. 123-494.000.

Stahl, Peter H.; and Schmitz, Beat, to Ciba-Geigy Corporation; and Henkel Kommanditgesellschaft auf Aktien. Crystalline disodium 3-amino-1-hydroxypropane-1,1-diphosphonate pentahydrate. 4,711,880, Cl. 514-108.000.

Stamegna, Andrew P.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Acrylourethane reaction product. 4,711,929, Cl. 525-131.000.

Standard Oil Company (Indiana): *See*—
Cartmell, Robert R.; and Horecky, Carl J., 4,711,766, Cl. 422-140.000.

Starr, Harvey W. Electric guitar pickup switching system. 4,711,149, Cl. 84-1.160.

State of Israel, Ministry of Defence, Israel Military Industries, The: *See*—
Meller, Yehuda, 4,711,047, Cl. 42-1.150.

State University of New York: *See*—
McNamara, Thomas F.; and Confessore, Fred, 4,711,851, Cl. 435-287.000.

Statton, Gary L.; and Gaul, James M., to Atlantic Richfield Company. Preparation of fire retardant flexible polyester based polyurethane foams having reduced discoloration and scorch. 4,711,910, Cl. 521-107.000.

Stauffer Chemical Company: *See*—
Leone-Bay, Andrea, 4,711,962, Cl. 548-337.000.

STC plc: *See*—
Pitt, Gillies D.; Extance, Philip; and Jones, Roger E., 4,712,065, Cl. 324-244.000.

Stecher, Gunther: *See*—
Glas, Hans J.; Hecht, Hans; Muller, Klaus; Spitzenberger, Kurt; and Stecher, Gunther, 4,711,130, Cl. 73-708.000.

Steeltin Can Corporation: *See*—
Kadunce, Leo, 4,711,801, Cl. 428-192.000.

Steffy, David A., to Hughes Aircraft Company. Apparatus for ejection of a spacecraft. 4,711,417, Cl. 244-158.00R.

Stegmeier, Karlheinz: *See*—
Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, 4,711,896, Cl. 514-570.000.

Stendel, Wilhelm: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,711,905, Cl. 514-522.000.

Stenmans, Heinz: *See*—
Frentzel-Beyme, Johannes; and Stenmans, Heinz, 4,711,081, Cl. 57-279.000.

Stephens, Barry D.: *See*—
Krage, William G.; Stephens, Barry D.; and Denman, Owen S., 4,711,481, Cl. 293-133.000.

Sterzel, Hans-Josef; and Sanner, Axel, to BASF Aktiengesellschaft. Membranes of substantially non-crosslinked organic polymers which contain bonded ionogenic groups. 4,711,907, Cl. 521-27.000.

Stessen, Lothar, to DIEHL GmbH & Co. Target tracking arrangement. 4,711,413, Cl. 244-3.160.

Stetter, Jorg: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; and Lunsen, Klaus, 4,711,658, Cl. 71-92.000.

Steuer, Joachim: *See*—
Hummel, Peter; and Steuer, Joachim, 4,711,175, Cl. 101-365.000.

Steuer, Robert R.; and Harris, David H., to Biokinetics, Inc. Physiological pressure monitor. 4,711,248, Cl. 128-748.000.

Stewart, Alva N., to Brown Jordan Company. Light fixture mounting. 4,712,166, Cl. 362-147.000.

Stewart, John M., to Sanitation Equipment Limited. Flush toilet. 4,710,988, Cl. 4-438.000.

Steyaert, Gordon C.: *See*—
McGuire, Charles F.; Weber, David J.; and Steyaert, Gordon C., 4,712,024, Cl. 307-529.000.

Stiglitz, Martin R.: *See*—
Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., 4,712,078, Cl. 331-99.000.

Stock, Gunter: *See*—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.

Stoffel, James C.; and Tandon, Jagdish C., to Xerox Corporation. Method and apparatus for fabricating full width scanning arrays. 4,712,018, Cl. 250-578.000.

Stokes, Kenneth B., to Medtronic, Inc. Body implantable lead. 4,711,251, Cl. 128-784.000.

Stoll, Donald H.: *See*—
Simonson, Dale E.; and Stoll, Donald H., 4,712,157, Cl. 361-357.000.

Stone Container Corporation: *See*—
Hood, Paul F., 4,711,702, Cl. 162-123.000.

Stone, Thomas R.: *See*—
Moon, William G.; Westwood, Donald C.; and Stone, Thomas R., 4,712,146, Cl. 360-97.000.

Stormont, Richard W.; and Eriss, Lawrence, to Mobil Solar Energy Corporation. Apparatus for and method of making crystalline bodies. 4,711,695, Cl. 156-608.000.

Stotts, Jay B.: *See*—
Erker, James W.; Scotese, Michael J.; and Stotts, Jay B., 4,711,614, Cl. 414-641.000.

Stranahan, Michael: *See*—
Lew, Hyok S.; and Stranahan, Michael, 4,711,057, Cl. 52-81.000.

Strapex AG: *See*—
Kagi, Bruno, 4,711,071, Cl. 53-589.000.

Streat, Michael; and Belfer-Canterman, Sofia, to National Research Development Corporation. Immobilized extractants. 4,711,863, Cl. 502-5.000.

Streb, Karl-Peter: *See*—
Oeschsle, Manfred; Szieslo, Uwe; Streb, Karl-Peter; and Simm, Wolfgang, 4,711,627, Cl. 431-30.000.

Street, Norman E.: *See*—
Ares, Roland A.; Jones, Robert A.; and Street, Norman E., 4,711,094, Cl. 62-90.000.

Stringfellow, William D., to Weatherford U.S., Inc. Valve assembly for inflatable packer. 4,711,301, Cl. 166-187.000.

Strolle, Clifford H.: *See*—
Stamegna, Andrew P.; and Strolle, Clifford H., 4,711,929, Cl. 525-131.000.

Strong, Russell W., to New Holland Inc. Integrally mounted positionable concave extension. 4,711,075, Cl. 130-27.00J.

Stuart, Richard J.: *See*—
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,156, Cl. 92-31.000.
Kayyod, Fariborz; Stuart, Richard J.; and Ogden, Jeffrey D., 4,711,157, Cl. 92-31.000.

Stubenberg, Johann; Denk, Heimo; and Zeiringer, Rudolf, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List. Pressure sensor. 4,711,129, Cl. 73-708.000.

Stupp, Edward H., to North American Philips Corporation. Complementary latcral insulated gate rectifiers with matched "on" resistances. 4,712,124, Cl. 357-23.400.

Suchy, Irmgard: *See*—
Aufdembrinke, Bernd; Dorow, Rainer; Horowski, Reinhard; Suchy, Irmgard; Schroeder, Gertrud; Wachtel, Helmut; Kehr, Wolfgang; and Stock, Gunter, 4,711,891, Cl. 514-313.000.

Sueyoshi, Tadahiro, to Yazaki Corporation. Terminal retaining structure for connector. 4,711,508, Cl. 439-595.000.

Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, to Tanabe Seiyaku Co., Ltd. Novel peptides and processes for preparing the same. 4,711,878, Cl. 514-18.000.

Sugita, Masaya: *See*—
Iino, Tadashi; Nagashima, Yoshikazu; and Sugita, Masaya, 4,711,544, Cl. 353-14.000.

Sugiura, Satsohi: *See*—
Hazato, Atsuo; Sugiura, Satsohi; Kurozumi, Seizi; and Noyori, Ryoji, 4,711,895, Cl. 514-530.000.

Suka, Motoshi; and Omi, Shinzo, to Suka, Motoshi. Process for producing polymethyl methacrylate. 4,711,938, Cl. 526-88.000.

Sukonnik, Israil M.; Judge, John S.; and Kilgore, Colin H., to Aluminum Company of America. Method for forming memory discs by forging. 4,711,115, Cl. 72-329.000.

Sule, Akos. Solenoid valve. 4,711,269, Cl. 137-625.500.

Sullivan, B. Patrick: *See*—
Meyer, Thomas J.; O'Toole, Terrence R.; Margerum, Lawrence D.; Westmoreland, T. David; Vining, William J.; Murray, Royce W.; and Sullivan, B. Patrick, 4,711,708, Cl. 204-280.000.

Sullivan, Steven K.: *See*—
Branson, Christopher W.; and Sullivan, Steven K., 4,712,058, Cl. 324-23.00R.

Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,711,550, Cl. 355-3.0SH.

Sumitomo Chemical Company, Limited: *See*—
Nakamatsu, Toshio; Miyamoto, Tetsuya; and Imada, Kunihiko, 4,711,641, Cl. 8-524.000.
Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, 4,711,873, Cl. 502-344.000.

Summers, Daniel R.: *See*—
Lockett, Michael J.; Summers, Daniel R.; Smith, Vinson C.; and Upchurch, James C., 4,711,745, Cl. 261-114.200.

Sunbeam Plastics Corporation: *See*—
Gach, Peter P., 4,711,372, Cl. 222-23.000.

Sundberg, Jack G.; and Noell, Godwin L., to Colt Industries Inc. Vane fuel pump having reduced displacement at high speeds. 4,711,619, Cl. 418-27.000.

Sundberg, Sten; Risberg, Stig; and Eriksson, Ulf, to Affarsverket FFV. Arrangement in a mine which is capable of being neutralized. 4,711,179, Cl. 102-426.000.

Sundstrand Corporation: *See*—
Nold, Robert D., 4,712,029, Cl. 310-71.000.

Sunohara, Tadaomi: *See*—
Kanoh, Kunihiko; Matsuki, Kanji; Ohta, Kazuhisa; and Sunohara, Tadaomi, 4,711,289, Cl. 164-34.000.

Sunstar Kabushiki Kaisha: *See*—
Joyashiki, Hisashi; Iwasawa, Minoru; Oohigashi, Masakazu; and Terai, Masao, 4,710,995, Cl. 15-22.00R.

Surgimach Corporation, The: *See*—
Fox, Lester A.; and Zielinski, Paul E., 4,711,066, Cl. 53-436.000.

Surrency, H. Skeet: *See*—
Johnson, Dennis M.; and Surrency, H. Skeet, 4,711,043, Cl. 36-139.000.

Sutoh, Akihiko: *See*—
Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.

Suzukamo, Gohfu; Fukao, Masami; Minobe, Masao; and Sakamoto, Akemi, to Sumitomo Chemical Company, Limited. Process for preparing solid base catalyst. 4,711,873, Cl. 502-344.000.

Suzuki, Akiyoshi: *See*—
Torigoe, Makoto; Suzuki, Akiyoshi; and Sakai, Terumasa, 4,711,568, Cl. 355-68.000.

Suzuki, Hirofumi: *See*—
Hoshizaki, Hiroki; Kawahara, Nobuaki; Suzuki, Hirofumi; and Oyobe, Kazuo, 4,711,990, Cl. 219-552.000.

Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, to Tokyo Electric Co., Ltd. Multi-range load cell weighing scale. 4,711,314, Cl. 177-164.000.

Suzuki, Tadashi; Okada, Kazuyoshi; and Abe, Noriyuki, to Nissan Motor Company, Limited. Network system utilizing an intermediate synchronizations signal and predetermined code string patterns. 4,712,211, Cl. 370-100.000.

Suzuki, Takehiro: *See*—
Katou, Yukio; Suzuki, Takehiro; and Shimada, Susumu, 4,711,316, Cl. 180-168.000.

Suzuki, Toshio; and Yahagi, Kazuyuki, to Kao Corporation. Hair cosmetic composition. 4,711,776, Cl. 424-70.000.

Svensson, A. Pedar: *See*—
Wallin, P. O. Thomas; Warell, Bengt H.; Svensson, A. Pedar; Lundstrom, Kurt A.; and Johansson, Lars A., 4,711,184, Cl. 108-144.000.

Swanson, Steven E.: *See*—
Shank, Jeffrey B.; Swanson, Steven E.; and Opdahl, Barry J., 4,711,518, Cl. 350-96.200.

Swarte, Petrus A., to U.S. Philips Corporation. Electro-acoustic system having a variable reflection/absorption characteristic. 4,712,247, Cl. 381-96.000.

Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Czenczy, George; Schoenberg, Andrew J., and Friedrich, Marju L., to Kollmorgen Technologies Corporation. Method of making wires scribed circuit boards. 4,711,026, Cl. 29-850.000.

Swin, Richard E., Sr.; and Atalla, Anwar A., to Tec-Air, Inc. Ductless air treating device with illuminator. 4,711,161, Cl. 98-31.500.

Synthelabo: *See*—
Gaudilliere, Bernard; and Rousseau, Jean, 4,711,899, Cl. 514-330.000.
Manoury, Philippe; Obitz, Daniel; and Peynot, Michel, 4,711,892, Cl. 514-336.000.

Sypula, Donald S.: *See*—
McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.

Syvarth, Anne S.; Gordin, Harvey H.; Early, Paul D., Jr.; Needs, Kathy A.; and Perfetti, Thomas A., to R. J. Reynolds Tobacco Company. Method and system for effecting sensory evaluation of a smoking product. 4,711,255, Cl. 131-330.000.

Szarz, Richard A.: *See*—
Paul, Albert P.; Szarz, Richard A.; and Card, Roger J., 4,711,669, Cl. 106-38.510.

Szieslo, Uwe: *See*—
Oeschsle, Manfred; Szieslo, Uwe; Streb, Karl-Peter; and Simm, Wolfgang, 4,711,627, Cl. 431-30.000.

Szonntagh, Eugene L.: *See*—
Cates, Marion H.; and Szonntagh, Eugene L., 4,711,765, Cl. 422-89.000.

't Lam, Hendrik: *See*—
Smid, Albert; Greve, Peter F.; and 't Lam, Hendrik, 4,712,205, Cl. 369-45.000.

Tabuchi, Kastumi: *See*—
Sato, Toshiaki; Mori, Hisako; Horio, Yashuhiko; Tabuchi, Kastumi; Matsumoto, Nobuo; and Nishii, Kazuhiko, 4,712,160, Cl. 361-388.000.

Tago, Mamoru: *See*—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.

Tahara, Yasuteru; and Koike, Kazuyoshi, to Mitsubishi Rayon Co., Ltd. Method and equipment for detecting pinholes of hollow filament. 4,711,121, Cl. 73-37.700.

Taisho Pharmaceutical Co., Ltd.: *See*—
Ikekawa, Nobuo, 4,711,881, Cl. 514-167.000.

Takada, Zenji: *See*—
Ando, Hirohito; Takada, Zenji; and Shigeta, Yuko, 4,711,674, Cl. 106-289.000.

Takagi, Makoto: *See*—
Takeuchi, Yukihisa; and Takagi, Makoto, 4,711,795, Cl. 427-130.000.

Takahashi, Kazuhisa: *See*—
Kawaguchi, Fumiaki; Shimazu, Toshikazu; and Takahashi, Kazuhisa, 4,712,117, Cl. 346-108.000.

Takahashi, Sadatoshi: *See*—
Matsushita, Takashi; Takahashi, Sadatoshi; Ikemori, Keiji; Kitagishi, Nozomu; Tanaka, Tsunefumi; and Momiyama, Kikuo, 4,711,534, Cl. 350-426.000.

Takahashi, Shuji: *See*—
Kabe, Kazuyuki; Morikawa, Tuneo; and Takahashi, Shuji, 4,711,286, Cl. 152-527.000.

Takahashi, Susumu: *See*—
Shishido, Yoshio; Takahashi, Susumu; Matsuo, Kazumasa; Miyazaki, Atsushi; Nishigaki, Shinichi; Kato, Shinichi; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,711,999, Cl. 250-204.000.

Takahashi, Takao: *See*—
Kato, Takatsugu; and Takahashi, Takao, 4,711,273, Cl. 139-116.000.

Takahashi, Yukio; Hayase, Isao; Amano, Keijirou; Mizukami, Masao; and Ishiguri, Masaaki, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Moving vane type compressor. 4,711,620, Cl. 418-96.000.

Takai, Haruki; Ujiie, Mikio; and Nakamura, Hideki, to NEC Corporation. Terminal control device for reference station in TDMA satellite communication system. 4,712,212, Cl. 370-104.000.

Takamine, Henry K., to Hughes Aircraft Company. Ground shield apparatus for giga-hertz test jig. 4,712,062, Cl. 324-158.00F.

Takara Company: *See*—
Fujiyama, Kunio, 4,711,486, Cl. 297-71.000.

Takashima, Susumu: *See*—
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, 4,712,243, Cl. 381-43.000.

Takeda Chemical Industries, Ltd.: *See*—
Okada, Hiroaki; Ogawa, Yasuaki; and Yashiki, Takatsuka, 4,711,782, Cl. 424-455.000.

Takeda, Fumiteru; Hirano, Katsuhiko; and Inagaki, Yoshihiro, to Nippon Gakki Seizo Kabushiki Kaisha. Fractional range selectable musical tone generating apparatus. 4,711,148, Cl. 84-1.010.

Takemura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, to Matsushita Electric Industrial Co., Ltd. Optical disk and method for reproducing reference signal therefrom. 4,712,204, Cl. 369-32.000.

Takenaka, Hirofumi: *See*—
Kishida, Hiroo; and Takenaka, Hirofumi, 4,710,994, Cl. 14-1.000.

Takenaka, Shigeo; Kamohara, Eiji; and Nishimura, Takashi, to Kabushiki Kaisha Toshiba. Color cathode ray tube with plural electron gun assemblies. 4,712,038, Cl. 313-2.100.

Takenaka, Shigeo; and Kamohara, Eiji, to Kabushiki Kaisha Toshiba. Electron gun with large aperture auxiliary electrode. 4,712,043, Cl. 315-15.000.

Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Fuel supply device for an internal combustion engine. 4,711,216, Cl. 123-447.000.

Takeuchi, Yukihisa; and Takagi, Makoto, to Nippondenso Co., Ltd. Method of manufacturing an amorphous-metal-coated structure. 4,711,795, Cl. 427-130.000.

Takigawa, Tadahiro: *See*—
Nishimura, Eiji; Takigawa, Tadahiro; and Kato, Yoshihide, 4,712,013, Cl. 250-492.200.

Takiguchi, Haruhisa: *See*—
Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,712,219, Cl. 372-45.000.

Talwar, Anil K.: *See*—
Denick, John, Jr.; Peters, David; Talwar, Anil K.; and Liao, Wei C., 4,711,774, Cl. 424-48.000.

Tamehiro, Taizo: *See*—
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.

Tamehiro, Tanezoh: *See*—
Hagiwara, Takeshi; Matsuo, Masataka; Tamehiro, Tanezoh; Tamehiro, Taizo; and Murakami, Kakuichi, 4,711,916, Cl. 523-223.000.

Tamoto, Koji: *See*—
Ichijima, Seiji; Ono, Mitsunori; Itoh, Isamu; Mihayashi, Keiji; Tamoto, Koji; and Nakamura, Yoshisada, 4,711,837, Cl. 430-548.000.

Tamura, Eiji, to Sony Corporation. Automatic centering method for a video camera. 4,712,187, Cl. 364-571.000.

Tamura, Kaoru: *See*—
Ohgoda, Makoto; and Tamura, Kaoru, 4,712,009, Cl. 250-327.200.

Tan, Hong S.; and Wegman, Bernardus B. M., to Gist-Brocades N.V. Pharmaceutical tablets. 4,711,777, Cl. 424-79.000.

Tan, Loon-Seng; and Arnold, Fred E., to University of Dayton. Bisdiene from bis-benzocyclobutene compound. 4,711,964, Cl. 548-461.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, 4,711,878, Cl. 514-18.000.

Tanabe, Toshiyuki, to Kabushiki Kaisha Toshiba. Sync apparatus for image multiplex transmission system. 4,712,131, Cl. 358-142.000.
Tanaka, Masanori, to Hosiden Electronics Co., Ltd. Socket of electrostatic protection type. 4,711,506, Cl. 439-108.000.
Tanaka, Nobuyoshi: *See*—
Hashimoto, Seiji; Kinoshita, Takao; and Tanaka, Nobuyoshi, 4,712,135, Cl. 358-213.220.
Tanaka, Tsunefumi: *See*—
Matsushita, Takashi; Takahashi, Sadatoshi; Ikemori, Keiji; Kitagishi, Nozomu; Tanaka, Tsunefumi; and Momiyama, Kikuo, 4,711,534, Cl. 350-426.000.
Tanaka, Yasuo: *See*—
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
Tanaka, Yoichi: *See*—
Miki, Nobuyuki; Yamaoka, Hiroshi; and Tanaka, Yoichi, 4,712,085, Cl. 338-22.0SD.
Tanazawa, Masayoshi; Shoji, Masaru; and Yamada, Wataru, to Casio Computer Co., Ltd. Movement of electronic watch of analog display type. 4,711,584, Cl. 368-88.000.
Tandon, Jagdish C.: *See*—
Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., 4,712,137, Cl. 358-213.290.
Stoffel, James C.; and Tandon, Jagdish C., 4,712,018, Cl. 250-578.000.
Tangonan, Gregory L.; Yen, Huan-Wun; and Persechini, David L., to Hughes Aircraft Company. Product of and process for forming tapered waveguides. 4,711,514, Cl. 350-96.120.
Taniguchi, Toshikatsu: *See*—
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
Tanimoto, Akikazu, to Nippon Kogaku K.K. Exposure apparatus. 4,711,567, Cl. 355-53.000.
Tanimura, Nobuyoshi; and Yasui, Tokumasa, to Hitachi, Ltd. Semiconductor memory device and fabrication process thereof. 4,712,192, Cl. 365-51.000.
Tanioka, Hiroshi; and Honma, Toshio, to Canon Kabushiki Kaisha. Copying apparatus with variable image magnification. 4,711,558, Cl. 355-14.00R.
Taniyama, Tadayoshi; and Yoshida, Koichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for production of biologically active substances. 4,711,842, Cl. 435-68.000.
Tannenbaum, Harvey P., to Du Pont de Nemours, E. I., and Company. Aqueous ink for use on fluorocarbon surfaces. 4,711,802, Cl. 428-207.000.
Tapeimp Limited: *See*—
Laing, John, 4,712,098, Cl. 340-669.000.
Tarrson, Emanual B.; and Maric, Dane, to John O. Butler Company. Interdental brush handle. 4,710,996, Cl. 15-105.000.
Tateosian, Louis H.; and Wilson, W. Donald, to Dentsply International Inc. Interpenetrating polymer network compositions employing rubber-modified polymers. 4,711,913, Cl. 522-14.000.
Tatsuhama, Tetsuro: *See*—
Maeda, Akiya; Sakai, Mituya; Masaka, Yukinobu; Nomura, Masahiro; Yamada, Yasuo; and Tatsuhama, Tetsuro, 4,711,501, Cl. 299-21.000.
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, to Kabushiki Kaisha Toshiba. Thermal-transfer printer. 4,712,115, Cl. 346-76.0PH.
Tauer, Dennis L.: *See*—
Davis, Loren G.; Schmitz, Steven R.; and Tauer, Dennis L., 4,712,210, Cl. 370-77.000.
Tawada, Yoshihisa: *See*—
Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, 4,711,807, Cl. 428-334.000.
Taylor, Jerry A., Sr., to Thermco Systems, Inc. Gas scavenger. 4,711,197, Cl. 118-715.000.
Taylor, Lawrence D., to Brandt, Inc. Electronic controller for dispensers and the like. 4,711,441, Cl. 271-6.000.
Taylor, Maurice E.: *See*—
Finegold, Aaron N.; and Taylor, Maurice E., 4,711,231, Cl. 128-79.000.
TDK Corporation: *See*—
Miki, Nobuyuki; Yamaoka, Hiroshi; and Tanaka, Yoichi, 4,712,085, Cl. 338-22.0SD.
Sawamura, Kentaro; Kosaka, Yoshio; and Yamaguchi, Masayasu, 4,711,861, Cl. 501-98.000.
TE-Co.: *See*—
Longenecker, Francis S.; Moeder, Kevin J.; and Wolff, Jeffrey L., 4,711,437, Cl. 269-91.000.
Tec-Air, Inc.: *See*—
Swin, Richard E., Sr.; and Atalla, Anwar A., 4,711,161, Cl. 98-31.500.
Techniservice: *See*—
Schwartz, Nathan G., 4,711,191, Cl. 112-410.000.
Tega, Ezio; Piccini, Fabrizio; Mazzini, Marco; and Magi, Raffaello, to Metalmeccanica Gori & Zucchi M.G.Z, S.p.A. Apparatus for handling and assembling axial electronic components on printed circuit cards. 4,711,015, Cl. 29-566.200.
Teichmann, Robert J. Nickel particle plating system. 4,711,814, Cl. 428-403.000.
Teijin Limited: *See*—
Hazato, Atsuo; Sugiura, Satsohi; Kurozumi, Seizi; and Noyori, Ryoji, 4,711,895, Cl. 514-530.000.
Tekma Oy: *See*—
Uimonen, Matti, 4,711,038, Cl. 34-25.000.
Tektronix, Inc.: *See*—
Branson, Christopher W.; and Sullivan, Steven K., 4,712,058, Cl. 324-23.00R.
Traa, Einar O., 4,712,087, Cl. 340-347.0CC.
Temcor: *See*—
Richter, Donald L., 4,711,063, Cl. 52-741.000.
Terai, Masao: *See*—
Joyashiki, Hisashi; Iwasawa, Minoru; Oohigashi, Masakazu; and Terai, Masao, 4,710,995, Cl. 15-22.00R.
Terasawa, Koji: *See*—
Kiyohara, Takehiko; Terasawa, Koji; and Miyakawa, Akira, 4,712,172, Cl. 346-1.100.
Terashima, Jun: *See*—
Arakawa, Kazuhiko; Terashima, Jun; and Tokura, Go, 4,711,548, Cl. 354-485.000.
Terashima, Kiichi: *See*—
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.
Teshima, Nobue: *See*—
Kato, Yasuyoshi; Teshima, Nobue; Ohta, Masao; and Konishi, Kunihiko, 4,711,872, Cl. 502-328.000.
Tetra Pak International AB: *See*—
Niske, Jorgen, 4,711,797, Cl. 428-35.000.
Texas Instruments Incorporated: *See*—
Douglas, Monte A., 4,711,698, Cl. 156-643.000.
McLevige, William V., 4,711,701, Cl. 437-41.000.
Orcutt, John W., 4,712,129, Cl. 357-84.000.
Rajasekaran, Periagaram K.; Doddington, George R.; and Schalk, Thomas B., 4,712,242, Cl. 381-42.000.
Textron/Auca Corp.: *See*—
Rusu, Radu, 4,711,615, Cl. 416-46.000.
Thaler, Arnold; and Yip, P. C., to Windmere Corporation. Electric hair dryer with multi-mode switch for air temperature and flowrate control. 4,711,988, Cl. 219-364.000.
Theil, Arne: *See*—
Verbeek, Pieter W.; Klaase, Theodorus A.; and Theil, Arne, 4,712,037, Cl. 310-323.000.
Theilacker, Klaus, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. System for lateral transport of liquid along a printing machine roller. 4,711,171, Cl. 101-148.000.
Theisen, William M.: *See*—
Wiseman, Charles D.; and Theisen, William M., 4,711,791, Cl. 427-96.000.
Thermalloy Incorporated: *See*—
Clemens, Donald L., 4,712,159, Cl. 361-386.000.
Thermco Systems, Inc.: *See*—
Taylor, Jerry A., Sr., 4,711,197, Cl. 118-715.000.
Yu, Chorng-Tao, 4,711,989, Cl. 219-390.000.
Thermo King Corporation: *See*—
Howland, Leland L.; and Seshadri, Jayaram, 4,711,095, Cl. 62-117.000.
Thermo Plastic Research Co., Ltd.: *See*—
Tipton, Lance W., 4,711,751, Cl. 264-159.000.
Thillays, Jacques C., to U.S. Philips Corporation. Method of manufacturing a terminal device for an optical fiber, and device thus obtained. 4,711,521, Cl. 350-96.200.
Thomas & Betts Corporation: *See*—
Noorily, Peter, 4,711,507, Cl. 439-292.000.
Noorily, Peter, 4,711,511, Cl. 439-347.000.
Thomas, Stephen M.: *See*—
Below, Randy; Burke, Howard; and Thomas, Stephen M., 4,712,234, Cl. 379-399.000.
Thomsen, Peter K. Arrangement for joining denture components by adhesion (device for binding parts of dental prosthesis by adhesion). 4,711,631, Cl. 433-181.000.
Thomson CSF: *See*—
d'Humieres, Etienne; Bernet, Jean M.; and Imhoff, Claude, 4,712,001, Cl. 250-213.0VT.
Dufour, Michel, 4,711,835, Cl. 430-314.000.
Lagier, Michel, 4,712,201, Cl. 367-92.000.
Thomson Video Equipment: *See*—
Soca, Serge, 4,712,132, Cl. 358-37.000.
Thornber, Craig W.: *See*—
Briggs, Malcolm T.; Dowell, Robert I.; and Thornber, Craig W., 4,711,887, Cl. 514-247.000.
Tibbals, E. C., Jr. Circular weft knitting machine. 4,711,100, Cl. 66-55.000.
Tillotson, Ltd.: *See*—
Scott, William A.; and Dull, Carl, 4,711,744, Cl. 261-64.400.
Tipton, Lance W., to Thermo Plastic Research Co., Ltd. Process and apparatus for stretching tubular extruded plastic material. 4,711,751, Cl. 264-159.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.
Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,940, Cl. 526-124.000.
Tobia, Alfonso J.: *See*—
Bandurco, Victor T.; Schwender, Charles F.; Falotico, Robert; and Tobia, Alfonso J., 4,711,883, Cl. 514-253.000.
Tokura, Go: *See*—
Arakawa, Kazuhiko; Terashima, Jun; and Tokura, Go, 4,711,548, Cl. 354-485.000.

Tokyo Electric Co., Ltd.: *See*—
Fujiwara, Tsutomu; Matsuda, Susumu; Murakami, Keisuke; Ogawa, Izumi; Tago, Mamoru; Aoki, Chihiro; Doi, Masahiro; and Anno, Hiroshi, 4,711,443, Cl. 271-126.000.
Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, 4,711,314, Cl. 177-164.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,540, Cl. 351-214.000.
Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, 4,711,541, Cl. 351-214.000.

Tomita, Satoru; and Adachi, Mitsunori, to Mitsubishi Denki Kabushiki Kaisha. Image pickup apparatus with range specification of displayed image. 4,712,142, Cl. 358-285.000.

Tomofuji, Yoshiaki: *See*—
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, 4,711,977, Cl. 178-18.000.

Tomohisa, Kunio; Cho, Masamichi; and Kurusu, Yasuo, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus for interpolating image signals. 4,712,141, Cl. 358-280.000.

Tong Lung Metal Industry Co., Ltd.: *See*—
Fann, Yaw-Shin; and Wu, Rong-Faa, 4,711,477, Cl. 292-169.140.

Tonhaeuser, Wilhelm: *See*—
Letsche, Ulrich; Rapp, Wolfgang, deceased; Haefner, Guenther; and Tonhaeuser, Wilhelm, 4,711,220, Cl. 123-502.000.

Torigoe, Makoto; Suzuki, Akiyoshi; and Sakai, Terumasa, to Canon Kabushiki Kaisha. Exposure apparatus. 4,711,568, Cl. 355-68.000.

Torii, Shunichi; Nagashima, Shigeo; and Omoda, Koichiro, to Hitachi, Ltd. Data processing apparatus. 4,712,175, Cl. 364-200.000.

Toshimitsu, Kenshi; and Kohayakawa, Hiromasa, to Kabushiki Kaisha Toshiba. Image forming apparatus having means for preventing damage to a photosensitive member. 4,711,555, Cl. 355-14.00R.

Toyoda Koki Kabushiki Kaisha: *See*—
Tsujiuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, 4,711,054, Cl. 51-165.770.

Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, to Ajinomoto Co., Inc. Method for preventing fouling of electrodialysis membrane. 4,711,722, Cl. 210-638.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Horiuchi, Yusuke; and Inui, Masaki, 4,711,135, Cl. 74-473.00R.
Kinoshita, Yoshiaki, 4,711,200, Cl. 123-492.000.
Shiroshita, Osamu; Ishiguro, Yasuo; and Itou, Yoshizumi, 4,712,183, Cl. 364-513.000.
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; Igashira, Toshihiko; and Nohira, Hidetaka, 4,711,216, Cl. 123-447.000.
Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, 4,711,136, Cl. 74-665.0GA.
Yoshitsugu, Noritada, 4,711,468, Cl. 280-804.000.

TPO "Pharmachim": *See*—
Atanassova, Ivanka A.; Haimova, Marieta A.; Chavdarova, Veselina B; Nakov, Anton I.; Petkov, Nedelcho G.; and Avramova, Ruska S., 4,711,956, Cl. 540-327.000.

Traa, Einar O., to Tektronix, Inc. Analog-to-digital converter error correction circuit. 4,712,087, Cl. 340-347.0CC.

Trinity Foundation: *See*—
Christine, William C., 4,711,373, Cl. 222-82.000.

Triquint Semiconductor, Inc.: *See*—
Weiss, Frederick G., 4,712,025, Cl. 307-571.000.

Troupes, Demetrios; and Alexander, Randall W., to International Business Machines Corporation. Method and apparatus for displaying enlarged or enhanced dot matrix characters. 4,712,102, Cl. 340-790.000.

TRW Inc.: *See*—
Lammert, Michael D., 4,711,017, Cl. 437-20.000.
Schnerk, Thomas G., 4,712,240, Cl. 387-3.000.

Tsimbler, Jury A.: *See*—
Alexandrov, Adolf M.; Vasiliev, Evgeny G.; Iskanderov, Alexandr A.; Magdenko, Vladimir S.; Melikov, Semen G.; Avsharov, Eduard R.; Tsimbler, Jury A.; and Presnyakov, Vladimir I., 4,711,182, Cl. 104-283.000.

Tsubakimoto Chain Company: *See*—
Kitaori, Tadahiro; Haginoya, Tsutomu; and Kawakura, Nobuto, 4,711,676, Cl. 148-319.000.

Tsuboi, Kunio: *See*—
Fujio, Akihiko; Iwaki, Hiroshi; Tsuboi, Kunio; and Sutoh, Akihiko, 4,711,551, Cl. 355-3.0DD.

Tsuchida, Youichi: *See*—
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, 4,711,977, Cl. 178-18.000.

Tsuchino, Kazunori: *See*—
Kawajiri, Kazuhiko; Fujiwara, Michio; Tsuchino, Kazunori; and Hisamori, Youichi, 4,711,091, Cl. 60-517.000.

Tsuda, Masaaki, to Kabushiki Kaisha Takara. Binding apparatus for sealing bags or the like. 4,711,064, Cl. 53-137.000.

Tsujiuchi, Toshio; Shinmura, Yoshinori; and Oda, Yukio, to Toyoda Koki Kabushiki Kaisha. Grinding machine with a steady rest. 4,711,054, Cl. 51-165.770.

Tsukahara, Hirokazu: *See*—
Kosaka, Takao; Okumura, Fumio; and Tsukahara, Hirokazu, 4,711,749, Cl. 264-4.700.

Tsukahara, Kenji; and Abe, Taizou, to Nippondenso Co., Ltd. Control apparatus for a variable displacement pump. 4,711,616, Cl. 417-216.000.

Tsunekawa, Tokuichi; and Sato, Yuichi, to Canon Kabushiki Kaisha. Signal processing circuit of solid state image pickup device. 4,712,136, Cl. 358-213.150.

Tsunekuni, Masao; and Ishizawa, Yasuhisa, to Canon Kabushiki Kaisha. Coordinate inputting apparatus using multiple sensors. 4,712,100, Cl. 340-710.000.

Tsuruoka, Ryoichi, to Rank Xerox Limited. Toner recovery device. 4,711,561, Cl. 355-3.00R.

Tuerk, James R. Tarp cover system for flat bed vehicles. 4,711,484, Cl. 296-105.000.

Tune, Raymond L.: *See*—
Loukanis, Jesse J.; Mathews, Will W.; and Tune, Raymond L., 4,711,143, Cl. 76-108.00A.

Turner, James E.: *See*—
Jacobson, Walter; Riggio, Stephen C.; and Turner, James E., 4,711,852, Cl. 436-15.000.

Tuy, Heang K.; and Koka, Narasimharao, to Picker International Inc. Malfunctioning computed tomography detector correction method. 4,712,178, Cl. 364-414.000.

Tyrell, John A.: *See*—
McCready, Russell J.; and Tyrell, John A., 4,711,933, Cl. 525-415.000.
McCready, Russell J.; and Tyrell, John A., 4,711,947, Cl. 528-288.000.
McCready, Russell J.; and Tyrell, John A., 4,711,948, Cl. 528-288.000.

Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Gasket for an internal combustion engine. 4,711,456, Cl. 277-235.00B.

Ueda, Kenji: *See*—
Fukuda, Masao; Kakita, Yukio; Ueda, Kenji; Terashima, Kiichi; and Bochi, Hiroshi, 4,711,345, Cl. 198-572.000.

Ueda, Masami: *See*—
Oida, Susumu; Munemoto, Yoshikazu; Ueda, Masami; and Ito, Michiaki, 4,711,105, Cl. 68-23.200.

Ueda, Yutaka; and Yamamuro, Tetsu, to Ricoh Company, Ltd. Optical information recording medium. 4,711,798, Cl. 428-65.000.

Uehara, Kuniaki: *See*—
Kutsukake, Mitsuhiro; Murata, Takahiko; Saito, Gunji; Komatsuzaki, Takeshi; Uehara, Kuniaki; Kato, Toshinobu; Hattori, Takeo; and Hayashida, Morimasa, 4,711,077, Cl. 56-320.200.

Uemura, Hiroyuki: *See*—
Shimada, Masaru; Kawanishi, Toshiyuki; Murakami, Kakuji; Aruga, Tamotsu; Uemura, Hiroyuki; and Nagai, Kiyofumi, 4,711,668, Cl. 106-22.000.

Ueno, Hiroshi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.
Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,940, Cl. 526-124.000.

Uesugi, Yoshinori, to Casio Computer Co., Ltd. Data processing apparatus. 4,712,196, Cl. 365-229.000.

Uhlmann, Eugen: *See*—
Konig, Wolfgang; Engels, Joachim; Uhlmann, Eugen; and Wetekam, Waldemar, 4,711,847, Cl. 435-70.000.

Uimonen, Matti, to Tekma Oy. Run-through brick drying plant and method for the control of its operation. 4,711,038, Cl. 34-25.000.

Ujiie, Mikio: *See*—
Takai, Haruki; Ujiie, Mikio; and Nakamura, Hideki, 4,712,212, Cl. 370-104.000.

Uliana, Anthony R.: *See*—
Bazilio, Rayman E.; Hartz, James F.; and Uliana, Anthony R., 4,711,328, Cl. 188-296.000.

Ullman, Myron, to Boardman Molded Products, Inc. Splash-proof closure. 4,711,360, Cl. 215-235.000.

Ullum, Henrik, to A/S Atlas. Rotary drier with lifting element. 4,711,041, Cl. 34-179.000.

Ulm, John G., to Liqui-Box Corporation. Tamper-evident seal for a toggle-type dispensing valve. 4,711,380, Cl. 222-541.000.

Ultima Electronics Ltd.: *See*—
Fathi, Saul S., 4,712,051, Cl. 318-564.000.

Ulysse Nardin S.A.: *See*—
Oechslin, Ludwig; Giger, Urs; and Sporing, Jorg, 4,711,583, Cl. 368-16.000.

Umeyama, Hideaki: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,711,958, Cl. 544-139.000.

Underwood, Lance D.; and Oliver, Michael S., to Smith International, Inc. Vibration and erosion resistant nozzle. 4,711,311, Cl. 175-340.000.

Union Camp Corporation: *See*—
Pavlin, Mark S.; and West, James C., 4,711,927, Cl. 524-531.000.

Union Carbide Corporation: *See*—
Acharya, Arun; and Bevier, William E., 4,711,646, Cl. 55-33.000.
Feinstein, Jonathan J., 4,711,430, Cl. 266-47.000.
Kokta, Milan R., 4,711,696, Cl. 156-617.0SP.
Lockett, Michael J.; Summers, Daniel R.; Smith, Vinson C.; and Upchurch, James C., 4,711,745, Cl. 261-114.200.
Pellet, Regis J.; and Hinchey, Richard J., 4,711,864, Cl. 502-65.000.
Salensky, George A., 4,711,817, Cl. 428-418.000.
Salensky, George A., 4,711,924, Cl. 524-402.000.
Sherwin, Maynard A.; and Koleske, Joseph V., 4,711,944, Cl. 526-318.420.
Skeels, Gary W.; and Breck, Donald W., deceased, 4,711,770, Cl. 423-328.000.

Uniqey (Hong Kong) Limited: *See—*
Yamashita, Toshihiko, 4,712,171, Cl. 363-142.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the: *See—*
Copp, Warren K., 4,711,411, Cl. 244-1.00R.
United States of America
Agriculture: *See—*
Harper, Robert J., Jr., 4,711,640, Cl. 8-481.000.
Kaneshiro, Tsuneo, 4,711,656, Cl. 71-7.000.
Air Force: *See—*
Foster, Joseph C., Jr.; and Bilek, Andrew G., 4,711,177, Cl. 102-204.000.
Oberly, Charles E.; Gegel, Harold L.; and Ho, James C., 4,711,825, Cl. 428-614.000.
Slobodnik, Andrew J., Jr.; Stiglitz, Martin R.; Roberts, George A.; and Webster, Richard T., 4,712,078, Cl. 331-99.000.
Army: *See—*
Gilbert, Everett E., 4,711,679, Cl. 149-96.000.
Energy: *See—*
Harvey, Alexander, 4,712,074, Cl. 328-233.000.
Osterwald, Carl R.; and Emery, Keith A., 4,712,063, Cl. 324-158.00D.
National Aeronautics and Space Administration: *See—*
Bell, Vernon L., 4,711,932, Cl. 525-397.000.
Cheng, Li-Jen, 4,711,857, Cl. 437-3.000.
Kaukler, William F., 4,711,697, Cl. 156-621.000.
Navy: *See—*
Morey, William W.; and Snitzer, Elias, 4,711,524, Cl. 350-96.250.
Neubert, Vernon H.; and Perrone, Nicholas, 4,711,424, Cl. 248-636.000.
Offe, Darrell L.; and Martin, R. Gregory, 4,711,086, Cl. 60-253.000.
U.S. Philips Corporation: *See—*
Albach, Manfred, 4,712,169, Cl. 363-89.000.
Bergsma, Wijtse; and Oord, Klaas T., 4,711,028, Cl. 30-43.600.
Kemner, Rudolf; and Kalmijn, Hilco T., 4,712,069, Cl. 324-322.000.
Kohler, Hans E. P., 4,712,105, Cl. 340-825.690.
Luyten, Peter R.; and Den Hollander, Jan A., 4,712,066, Cl. 324-309.000.
Penna, David E., 4,712,191, Cl. 364-900.000.
Roschmann, Peter; and Simon, Howard E., 4,712,067, Cl. 324-318.000.
Schoofs, Franciscus A. C. M.; Bierhoff, Martinus P. M.; Van Mil, Job F. P.; and Slomp, Albert H., 4,712,091, Cl. 340-347.0DA.
Smid, Albert; Greve, Peter F.; and 't Lam, Hendrik, 4,712,205, Cl. 369-45.000.
Smulders, Henricus W. W., 4,711,519, Cl. 350-96.200.
Swarte, Petrus A., 4,712,247, Cl. 381-96.000.
Thillays, Jacques C., 4,711,521, Cl. 350-96.200.
Van Hoof, Isidoor K.; and Aarts, Herman J. C. M., 4,711,824, Cl. 428-607.000.
Van Leunen, Johannes A. J., 4,712,011, Cl. 250-361.00R.
Van Meurs, Johannes M., 4,712,045, Cl. 315-224.000.
Van Rumpt, Herman W.; and Razzell, Charles J. H., 4,712,073, Cl. 328-160.000.
United States Tobacco Company: *See—*
Paules, Eugene H., 4,711,687, Cl. 156-235.000.
United Technologies Corporation: *See—*
Cusack, Michael D., 4,711,700, Cl. 156-651.000.
University of Dayton: *See—*
Salyer, Ival O., 4,711,813, Cl. 428-402.000.
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USX Corporation: *See—*
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Valmet-KMW Aktiebolag: *See—*
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Van Leunen, Johannes A. J., to U.S. Philips Corporation. X-ray image intensifier tube including a luminescent layer which absorbs secondary radiation. 4,712,011, Cl. 250-361.00R.
Van Meurs, Johannes M., to U.S. Philips Corporation. Electric arrangement for regulating the luminous intensity of at least one discharge lamp. 4,712,045, Cl. 315-224.000.
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Schoofs, Franciscus A. C. M.; Bierhoff, Martinus P. M.; Van Mil, Job F. P.; and Slomp, Albert H., 4,712,091, Cl. 340-347.0DA.
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Velisavljevic, Dobrila. High pressure fitting. 4,711,475, Cl. 285-348.000.
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Verber, Carl M., to Battelle Memorial Institute. All-optical A/D conversion using integrated nonlinear guided wave optical circuitry. 4,712,089, Cl. 340-347.0AD.
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Vu, Tho T., to Honeywell Inc. Multiple input OR-AND circuit for FET logic. 4,712,022, Cl. 307-448.000.

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W. Hegenscheidt GmbH: *See*—
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Wada, Fumio: *See*—
Asami, Kazutomo; Sano, Fumiaki; Wada, Fumio; and Ishijima, Koji, 4,711,617, Cl. 417-295.000.

Wafer, Don B.; and Barrington, Claud C., to FMC Corporation. Unidirectional/bi-directional gate valve. 4,711,262, Cl. 137-14.000.

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Walker, David L., to Zenith Electronics Corporation. Method and apparatus for unscrambling sync-suppressed television signals. 4,712,237, Cl. 380-15.000.

Walker, Frederick J.; and LaMattina, John L., to Pfizer Inc. Hydroxy and alkoxy pyrimidines. 4,711,888, Cl. 514-269.000.

Wallermann, Heinrich, to Diehl GmbH & Co. Method for homing onto a target. 4,711,412, Cl. 244-3.150.

Wallin, P. O. Thomas; Warell, Bengt H.; Svensson, A. Pedar; Lundstrom, Kurt A.; and Johansson, Lars A. Arrangement for a desk comprising a desk-top which can be raised and lowered. 4,711,184, Cl. 108-144.000.

Walter, Robert, to Rowenta-Werke GmbH. Method of sealing off the vaporization chamber of a steam iron. 4,711,010, Cl. 29-157.00R.

Wang, Kenneth Y.: *See*—
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Ward, David C.; Langer, Pennina R.; and Waldrop, Alexander A., III, to Yale University. Modified nucleotides and methods of preparing and using same. 4,711,955, Cl. 536-29.000.

Warden, Hans-Erik, to Siemens Aktiengesellschaft. X-ray film holder and method of operating same for optional fluoroscopic or radiographic examination of a patient. 4,712,227, Cl. 378-173.000.

Wardlaw, Louis J., III; and Young, Joe A. Downhole cementing tool assembly. 4,711,300, Cl. 166-153.000.

Warell, Bengt H.: *See*—
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Warwick, Alastair A.; Schenkel, David P.; and Ng, Kenny Y., to Northern Telecom Limited. Flip status line. 4,712,213, Cl. 371-15.000.

Wasel, Horst P.; and Grollius, Horst W., to Atlas Copco Aktiebolag. Method of producing groove/land patterns for dynamic bearings. 4,711,706, Cl. 204-129.650.

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Watanabe, Eiki, to Mitsubishi Denki Kabushiki Kaisha. Display device for an escalator. 4,711,335, Cl. 198-324.000.

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Watanabe, Kozo; Kando, Akiyoshi; and Horita, Yoshiyuki, to Yoshida Kogyo K.K. Top end-stop attaching machine with improved top end-stop supplying apparatus. 4,711,020, Cl. 29-767.000.

Watanabe, Masahiko: *See*—
Omae, Tsutomu; Obara, Sanshiro; Kubo, Kenji; and Watanabe, Masahiko, 4,712,052, Cl. 318-625.000.

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Watson, Martin J., to Metal Box p.l.c. Apparatus for heat-setting a tubular article of crystallizable polymer. 4,711,624, Cl. 425-384.000.

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Garvey, Christopher M.; Savoly, Arpad; and Weatherford, Thomas M., 4,711,731, Cl. 252-8.514.

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Weber, Eugen: *See*—
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Webster, Owen W., to Du Pont de Nemours, E. I., and Company. "Living" polymers and process for their preparation. 4,711,942, Cl. 526-185.000.

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Weekley, William G.: *See*—
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Weindorf, Paul F. L., to Sperry Corporation. Power on demand beam deflection system for dual mode CRT displays. 4,712,047, Cl. 315-397.000.

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Weisberg, Sharon L.: *See*—
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Weisenbarger, Gale M.; and Moran, John C. Magnetic fluid conditioner. 4,711,271, Cl. 137-827.000.

Weiss, Frederick G., to Triquint Semiconductor, Inc. Analog switch. 4,712,025, Cl. 307-571.000.

Welander, Walter E. Mechanical automatic transmission. 4,711,137, Cl. 74-751.000.

Welter, Andre ; Leyck, Sigurd; and Etschenberg, Eugen, to A. Nattermann & Cie GmbH. Benzisoselenazolethiones and process for the treatment of various diseases in humans. 4,711,961, Cl. 548-121.000.

Wensing, Helmut: *See*—
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Wenzel, Bruce E.; and Clark, James P., to Henkel Corporation. Stabilized tocopherol in dry, particulate, free-flowing form. 4,711,894, Cl. 514-458.000.

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West, Lynn P.: *See*—
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West Penn Plastic, Inc.: *See*—
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Westhoff, James A.: *See*—
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Westinghouse Electric Corp.: *See*—
Bednar, Fred H., 4,711,754, Cl. 376-245.000.
Blaushild, Ronald M., 4,711,760, Cl. 376-399.000.
Choyke, Wolfgang J.; Wood, Susan, Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.
Conrad, Kenneth C., 4,711,007, Cl. 29-156.80R.
Feilchenfeld, Michal M.; and Connors, Grant R., 4,711,757, Cl. 376-258.000.
Kobuck, Richard M.; and Kalkbrenner, Ralph W., 4,711,436, Cl. 269-40.000.
Kwon, Young J.; and Schulte, Susan M., 4,711,664, Cl. 75-84.500.
Machado, Octavio J.; Daugherty, David A.; Andrews, Ronnie H.; and Efferding, Larry E., 4,711,758, Cl. 376-272.000.
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Miller, Reno W.; and Grobmyer, Louis R., 4,711,753, Cl. 376-216.000.
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Orndorff, Karl B.; and Baldwin, Paul L., 4,711,322, Cl. 187-1.00R.
Peterson, Steven H.; Lahoda, Edward J.; and Weisberg, Sharon L., 4,711,768, Cl. 423-21.500.
Pregnall, Richard A.; and LeGrand, Archie M., Jr., 4,711,854, Cl. 436-144.000.
Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, 4,711,755, Cl. 376-260.000.
Scrabis, Charles M.; Mazza, Gregory E.; Golick, Leonard R.; and Pomaibo, Paul, 4,711,759, Cl. 376-284.000.
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Wey, Feng-Feng, to 501 China Technical Consultants, Inc. Process for producing anthraquinone-1-sulphonic acid by sulphonation with palladium catalyst. 4,711,743, Cl. 260-370.000.

Weyerhaeuser Company: *See*—
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Wezel, Erich, to Hilti Aktiengesellschaft. Drill chuck for hand-held tools. 4,711,457, Cl. 279-65.000.

Whaley, Alvin W. Dye color control system. 4,710,993, Cl. 8-158.000.

Wharton McDaniel, William P.: *See*—
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White, Leonard A.; and Carveth, Peter C., to Baxter Travenol Laboratories, Inc. Container such as a nursing container, having protection compartment for dispensing member. 4,711,359, Cl. 215-11.100.

Whitehead, Edward J., to Duro Med Industries, Inc. Therapeutic hand exerciser. 4,711,445, Cl. 272-67.000.

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Wielandt, Ralph T.: *See*—
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Wiens, Terry G.; and Featherston, William L. Apparatus which is convertible between an umbrella and a golfing backstop. 4,711,260, Cl. 135-16.000.

Wierzbicki, Michel; Hugon, Pierre; and Poignant, Jean-Claude, to Adir et Compagnie. N-(N'-phenylpiperazine)-alkyl triazole compounds having anxiolytic and analgesic properties. 4,711,885, Cl. 514-253.000.

Wijntjes, Geert; and Hercher, Michael, to Beckman Instruments, Inc. Dynamic mirror alignment control. 4,711,573, Cl. 356-346.000.

Wilhelmi, Juergen, to Heinrich Wilhelmi GmbH & Co. Metal fitting. 4,711,593, Cl. 403-187.000.

Wilkerson, James R., to Cincinnati Milacron Inc. Interference detector for laser cutting machine. 4,711,985, Cl. 219-121.0LB.

Wilkins, John J.: *See*—
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Wilkinson, Blair E., to Johnston, H. Fred; and Grosso, Carl. System for automatically inspecting a flat workpiece for holes. 4,711,579, Cl. 356-375.000.

Wilkinson, John; and Holbrook, Nicholas, to Ashfield, Jacqueline M.; and Ashfield, Michele. Roof and a method of providing a building with a roof. 4,711,061, Cl. 52-410.000.

Wilks, Thomas M., to Laggan Marine Developments Limited. Marine survival system. 4,711,196, Cl. 114-365.000.

Williams, Rodger W.; and Atwood, Charles W., to Vxtra Corp. Delicate instrument holder and protector. 4,711,352, Cl. 206-365.000.

Willis, Robert E. Intravaginal device. 4,711,235, Cl. 128-130.000.

Willock, Charles B.: *See*—
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Wilmore, Scott H.; and Robinson, Ronald D. Headrest pillow. 4,710,991, Cl. 5-435.000.

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Wilson, Ronald C.: *See*—
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Tateosian, Louis H.; and Wilson, W. Donald, 4,711,913, Cl. 522-14.000.

Windmere Corporation: *See*—
Thaler, Arnold; and Yip, P. C., 4,711,988, Cl. 219-364.000.

Winkelmann, Manfred: *See*—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.

Winkler, Hans-Joachim: *See*—
Heinz, Michael; Lange, Joachim; Muschner, Udo; Naefe, Herbert; Rothfuss, Hans; Winkelmann, Manfred; and Winkler, Hans-Joachim, 4,711,432, Cl. 266-220.000.

Winter, Joseph; and Pryor, Michael J., to Olin Corporation. Process and apparatus for fabricating optical fiber cables. 4,711,388, Cl. 228-148.000.

Wiseman, Charles D.; and Theisen, William M., to BOC Group, Inc., The. Method of making a flexible microcircuit. 4,711,791, Cl. 427-96.000.

Wiseman, Michael D., to Hydro-Pulse, Inc. Surge irrigation valve. 4,711,272, Cl. 137-887.000.

Witco Corporation: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,711,909, Cl. 521-69.000.

Witte, Ernst-Christian: *See*—
Bar-Tana, Jacob; Witte, Ernst-Christian; Hagenbruch, Bernd; Pill, Johannes; and Stegmeier, Karlheinz, 4,711,896, Cl. 514-570.000.

Witten, Alvin E.; and Witten, Erik H., to Witten Automatic Vent Company, Inc. Two-piece foundation ventilator. 4,711,160, Cl. 98-29.000.

Witten Automatic Vent Company, Inc.: *See*—
Witten, Alvin E.; and Witten, Erik H., 4,711,160, Cl. 98-29.000.

Witten, Erik H.: *See*—
Witten, Alvin E.; and Witten, Erik H., 4,711,160, Cl. 98-29.000.

Wittkopp, Helmut: *See*—
Lung, Dieter; Kluft, Werner; Fabry, Jochen; Wittkopp, Helmut; Dombrowski, Theodor; and Klosterhalfen, Hartwig, 4,711,146, Cl. 82-1.00C.

Wittmann, Franz: *See*—
Mugrauer, Hubert; Puritscher, Ernst; and Wittmann, Franz, 4,711,564, Cl. 355-30.000.

Wittnebel, Bruce W., to Minnesota Mining and Manufacturing Company. Transparent sheet material for electrostatic copiers. 4,711,816, Cl. 428-412.000.

Wolf, Hans P.: *See*—
Harder, Christoph S.; Jaeckel, Heinz; and Wolf, Hans P., 4,711,858, Cl. 437-99.000.

Wolf, Joachim. Filter cartridge for fluids. 4,711,717, Cl. 210-137.000.

Wolf, Jurgen: *See*—
Holderle, Hans; Wolf, Jurgen; Eckhart, Horst; and Vonderau, Werner, 4,711,225, Cl. 123-590.000.

Wolf, Karlheinz: *See*—
Wolff, Joachim; and Wolf, Karlheinz, 4,711,642, Cl. 8-527.000.

Wolff, Jeffrey L.: *See*—
Longenecker, Francis S.; Moeder, Kevin J.; and Wolff, Jeffrey L., 4,711,437, Cl. 269-91.000.

Wolff, Joachim; and Wolf, Karlheinz, to Bayer Aktiengesellschaft. Liquid, water containing mono-fluoro-triazinyl reactive dyestuff preparation with pH 8–12. 4,711,642, Cl. 8-527.000.

Wolfrum, Gerhard: *See*—
Heidenreich, Holger; and Wolfrum, Gerhard, 4,711,954, Cl. 534-780.000.

Wolters, Donald R., to J & L Associates, Inc. Apparatus and method for installing gutter drops on rain gutters. 4,711,012, Cl. 29-243.520.

Wood, Kenneth O.: *See*—
Logan, David J.; Wood, Kenneth O.; Hernandez, William; and Edwards, Richard L., 4,711,035, Cl. 33-200.000.

Wood, Susan: *See—*
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.

Woods, David R.: *See—*
Rawlings, Douglas E.; and Woods, David R., 4,711,849, Cl. 435-91.000.

Wooley, Orval H.: *See—*
Falwell, Bobby R.; and Wooley, Orval H., 4,710,992, Cl. 5-508.000.

Wright, Harry D.; Hale, John M.; and Weber, Eugen, to Orbisphere Corporation Wilmington, Succursale de Collonge-Bellerive. Thermal protection method for electroanalytical cell. 4,711,703, Cl. 204-1.00T.

Wright, Roy F.: *See—*
Yu, Michael C.; and Wright, Roy F., 4,711,796, Cl. 427-185.000.

Wright State University: *See—*
Petrofsky, Jerrold S., 4,711,242, Cl. 128-419.00R.

Wu, Rong-Faa: *See—*
Fann, Yaw-Shin; and Wu, Rong-Faa, 4,711,477, Cl. 292-169.140.

Wursthorn, Karl R.: *See—*
Kugele, Thomas G.; Mesch, Keith A.; Wursthorn, Karl R.; and Conroy, Gary M., 4,711,920, Cl. 524-178.000.

Wynosky, Charles E.; and Mraz, Joseph, to Coalair Systems. High speed auger venturi system and method for conveying bulk materials. 4,711,607, Cl. 406-30.000.

Xerox Corporation: *See—*
Henry, Arnold W., 4,711,818, Cl. 428-421.000.
Kadekodi, Narayan K.; Ibrahim, Abd-El-Fattah A.; Handy, Roland J.; and Tandon, Jagdish C., 4,712,137, Cl. 358-213.290.
McAneney, T. Brian; Loutfy, Rafik O.; Mammino, Joseph; Nichol-Landry, Deborah J.; and Sypula, Donald S., 4,711,833, Cl. 430-131.000.
Stoffel, James C.; and Tandon, Jagdish C., 4,712,018, Cl. 250-578.000.

Yagi, Tetsuya: *See—*
Arakawa, Kazuo; Hayakawa, Naohiro; Yoshida, Kenzo; Yagi, Tetsuya; and Nakanishi, Hiroshi, 4,711,732, Cl. 252-28.000.

Yahagi, Kazuyuki: *See—*
Suzuki, Toshio; and Yahagi, Kazuyuki, 4,711,776, Cl. 424-70.000.

Yale University: *See—*
Ward, David C.; Langer, Pennina R.; and Waldrop, Alexander A., III, 4,711,955, Cl. 536-29.000.

Yamada, Chikara; Watabe, Yoji; Irako, Koichi, deceased (by Irako, Sanae, legal heir); and Murakamai, Yuichi, to Bridgestone Corporation. Exhaust gas purifying catalyst. 4,711,870, Cl. 502-303.000.

Yamada, Kouichi, to NEC Corporation. Data control circuits. 4,712,090, Cl. 340-347.0DD.

Yamada, Mutsuo: *See—*
Ishida, Tetsuyoshi; Okiura, Kunio; Hanayama, Fumihiko; Yamada, Mutsuo; and Arikawa, Yoshijiro, 4,711,828, Cl. 429-12.000.

Yamada, Wataru: *See—*
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Yamada, Yasuo: *See—*
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Yamada, Yasuyuki: *See—*
Hanai, Kazuko; and Yamada, Yasuyuki, 4,711,819, Cl. 428-425.900.

Yamaguchi, Masayasu: *See—*
Sawamura, Kentaro; Kosaka, Yoshio; and Yamaguchi, Masayasu, 4,711,861, Cl. 501-98.000.

Yamaguchi, Morio, to Max Co., Ltd. Printing wire driving device in wire dot printer. 4,711,170, Cl. 101-93.050.

Yamaguchi, Seiji; Ichinohe, Eisuke; and Katsura, Johji, to Matsushita Electric Industrial Co., Ltd. Static random access memory. 4,712,194, Cl. 365-203.000.

Yamakawa, Yoshihiro: *See—*
Kuwabara, Takashi; Shimura, Yoshiharu; Hayashi, Yuko; Hanamure, Toshiyuki; Kanemori, Kaoru; and Yamakawa, Yoshihiro, 4,711,098, Cl. 62-441.000.

Yamamori, Kenji: *See—*
Tatsumi, Hisao; Kayata, Haruhiko; Yamamori, Kenji; Kakizawa, Toshio; and Mogi, Toshiaki, 4,712,115, Cl. 346-76.0PH.

Yamamoto, Hirohiko: *See—*
Ohta, Tomozo; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,712,111, Cl. 343-779.000.

Yamamoto, Kenji; Nakayama, Takehisa; and Tawada, Yoshihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Insulating material of non-single crystalline silicon compound. 4,711,807, Cl. 428-334.000.

Yamamoto, Saburo: *See—*
Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, 4,712,219, Cl. 372-45.000.

Yamamoto, Tadashi; Imai, Masafumi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, to TOA Nenryo Kogyo Kabushiki Kaisha. Process for preparing catalyst component for polymerization of olefins. 4,711,940, Cl. 526-124.000.

Yamamoto, Tadashi: *See—*
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,711,939, Cl. 526-124.000.

Yamamoto, Toshiro; Kobayashi, Ryohei; Kurimoto, Mamoru; and Ozone, Toshio, to Aichi Steel Works, Ltd.; and Chuo Hatsujo Kabushiki Kaisha. Process for improving the sag-resistance and hardenability of a spring steel. 4,711,675, Cl. 148-144.000.

Yamamura, Michio: *See—*
Sugano, Hiroshi; Ishida, Ryuichi; and Yamamura, Michio, 4,711,878, Cl. 514-18.000.

Yamamuro, Tetsu: *See—*
Ueda, Yutaka; and Yamamuro, Tetsu, 4,711,798, Cl. 428-65.000.

Yamaoka, Hiroshi: *See—*
Miki, Nobuyuki; Yamaoka, Hiroshi; and Tanaka, Yoichi, 4,712,085, Cl. 338-22.0SD.

Yamashita, Toshihiko, to Uniqey (Hong Kong) Limited. Electrical power source. 4,712,171, Cl. 363-142.000.

Yamatake Honeywell: *See—*
Fujiwara, Masatoshi; Kuroda, Masato; and Shiga, Tatsuhide, 4,712,173, Cl. 364-138.000.

Yanagihara, Kenji: *See—*
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Niinomi, Masahiro; Yanagihara, Kenji; and Kimura, Mituo, 4,711,809, Cl. 428-336.000.

Yang, Darchun B.: *See—*
Wachs, Israel E.; and Yang, Darchun B., 4,711,871, Cl. 502-325.000.

Yang, Frank C.: *See—*
Heard, Charles M.; and Yang, Frank C., 4,712,222, Cl. 375-77.000.

Yang, Robert K., to Warner-Lambert Company. Encapsulation composition for use with chewing gum and edible products. 4,711,784, Cl. 426-5.000.

Yano, Seiki; Yamamoto, Saburo; Takiguchi, Haruhisa; and Kaneiwa, Shinji, to Sharp Kabushiki Kaisha. Visible double heterostructure-semiconductor laser. 4,712,219, Cl. 372-45.000.

Yashiki, Takatsuka: *See—*
Okada, Hiroaki; Ogawa, Yasuaki; and Yashiki, Takatsuka, 4,711,782, Cl. 424-455.000.

Yasui, Tokumasa: *See—*
Tanimura, Nobuyoshi; and Yasui, Tokumasa, 4,712,192, Cl. 365-51.000.

Yates, Larry A. Heating device for use with asphalt pavement resurfacing equipment. 4,711,600, Cl. 404-95.000.

Yazaki Corporation: *See—*
Iino, Tadashi; Nagashima, Yoshikazu; and Sugita, Masaya, 4,711,544, Cl. 353-14.000.
Sueyoshi, Tadahiro, 4,711,508, Cl. 439-595.000.

Yeckley, Russel L.; and North, Bernard, to Kennametal Inc. Ceramic material and method of manufacture. 4,711,644, Cl. 51-307.000.

Yen, Huan-Wun: *See—*
Tangonan, Gregory L.; Yen, Huan-Wun; and Persechini, David L., 4,711,514, Cl. 350-96.120.

Yen, Wei Hsiung. Inspectable antistatic container for packing electrical or electronic devices. 4,711,350, Cl. 206-328.000.

Yip, P. C.: *See—*
Thaler, Arnold; and Yip, P. C., 4,711,988, Cl. 219-364.000.

Yli-Vakkuri, Erkki P. J.: *See—*
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,712,086, Cl. 338-315.000.

Yojigen Agricultural Corporation: *See—*
Odaira, Keikichi, 4,711,787, Cl. 426-31.000.

Yokohama Rubber Co., Ltd., The: *See—*
Kabe, Kazuyuki; Morikawa, Tuneo; and Takahashi, Shuji, 4,711,286, Cl. 152-527.000.

Yokotani, Yoichiro; Kato, Junichi; Nishida, Masamitsu; Kawashima, Syunichiro; and Ouchi, Hiromu, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramic compositions. 4,711,862, Cl. 501-136.000.

Yokoyama, Kenzou: *See—*
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.

Yokoyama, Naoki, to Fujitsu Limited. High-speed semiconductor device. 4,712,121, Cl. 357-4.000.

Yokozeki, Kenzo; and Kubota, Koji, to Ajinomoto Company, Incorporated. Process for the production of L-aspartyl-L-phenylalanine methy ester or L-aspartyl-L-phenylalanine. 4,711,846, Cl. 435-70.000.

Yoneda, Katsuki, to Satoh Seiki Co., Ltd. Preparatory devices for a pocket sewing machine. 4,711,188, Cl. 112-104.000.

Yonekubo, Hiroaki: *See—*
Kidouchi, Yasuo; and Yonekubo, Hiroaki, 4,711,392, Cl. 236-12.120.

Yoshida, Keiji: *See—*
Nishimori, Kadotaro; Yoshida, Keiji; and Ohira, Tadashi, 4,711,569, Cl. 355-69.000.

Yoshida, Kenzo: *See—*
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Yoshida Kogyo K.K.: *See—*
Watanabe, Kozo; Kando, Akiyoshi; and Horita, Yoshiyuki, 4,711,020, Cl. 29-767.000.

Yoshida, Koichi: *See—*
Taniyama, Tadayoshi; and Yoshida, Koichi, 4,711,842, Cl. 435-68.000.

Yoshidg Kogyo K. K.: *See—*
Hatta, Keizo, 4,711,040, Cl. 34-73.000.

Yoshihara, Tsutomu: *See—*
Miyatake, Hideshi; Fujishima, Kazuyasu; Yoshihara, Tsutomu; Kumanoya, Masaki; Hidaka, Hideto; and Dosaka, Katsumi, 4,712,123, Cl. 357-23.600.

Yoshiike, Nobuyuki; and Kondo, Shigeo, to Matsushita Electric Industrial Co., Ltd. Recording medium. 4,711,815, Cl. 428-411.100.

Yoshikawa, Junichi; and Rachi, Masahiro, to Canon Kabushiki Kaisha. Rotary encoder with source-adjacent light sampling and control. 4,712,000, Cl. 250-205.000.

Yoshimoto, Toshio: *See*—
Seto, Kaoru; Ushio, Yukihide; Hori, Kenjiro; Hashimoto, Hiroshi; Yoshimoto, Toshio; and Kanaiwa, Kiyoshi, 4,712,118, Cl. 346-108.000.

Yoshinaka, Toshio; Taniguchi, Toshikatsu; Ida, Shuichiro; Nagano, Shuji; Kimura, Shigeru; and Tanaka, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Power transfer device for four-wheel drive. 4,711,136, Cl. 74-665.0GA.

Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye disease inspecting instrument. 4,711,540, Cl. 351-214.000.

Yoshino, Hisakazu; Nishimura, Shinichi; and Sasaki, Kazuyuki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Slit lamp and accessory device thereof. 4,711,541, Cl. 351-214.000.

Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Guide rail for seat belt device. 4,711,468, Cl. 280-804.000.

Yoshizumi, Tomoya: *See*—
Toyoshi, Seiji; Yoshizumi, Tomoya; Saeki, Masaru; and Kawakita, Tetsuya, 4,711,722, Cl. 210-638.000.

Younes, Usama E., to Atlantic Richfield Co. Flame-retardant molded composition which incorporates a poly(styrene-co-maleic anhydride-co-dibromostyrene) copolymer. 4,711,941, Cl. 526-272.000.

Young, Grant A., to Amoco Corporation. Tangentially staged hydrocyclones. 4,711,720, Cl. 210-512.200.

Young, Joe A.: *See*—
Wardlaw, Louis J., III; and Young, Joe A., 4,711,300, Cl. 166-153.000.

Younger, Gilbert W. Throttle valve system for automatic transmissions. 4,711,140, Cl. 74-865.000.

Yu, Chorng-Tao, to Thermco Systems, Inc. Diffusion furnace multi-zone temperature control. 4,711,989, Cl. 219-390.000.

Yu, Michael C.; and Wright, Roy F., to Phillips Petroleum Company. Poly(arylene sulfide) coating compositions. 4,711,796, Cl. 427-185.000.

Yu, Thomas C.; Vogt, Robert K.; and Wilkins, John J., to E. W. Buschman Company, The. Package sortation conveyor. 4,711,341, Cl. 198-372.000.

Yuasa, Satoshi: *See*—
Haruta, Masahiro; Kuwae, Yoko; Yuasa, Satoshi; and Miyazaki, Toshihiko, 4,711,830, Cl. 430-52.000.

Yukumoto, Hideki: *See*—
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, 4,711,214, Cl. 123-425.000.

Yushiro Chemical Industry Co., Ltd.: *See*—
Kanda, Noboru; Yokoyama, Kenzou; Aoki, Ken-ichi; Akita, Shinji; Hatanaka, Masayuki; and Oda, Tatsuharu, 4,711,733, Cl. 252-29.000.

Yuyama, Masami: *See*—
Ninomiya, Masao; Takashima, Susumu; Fukushima, Kazumasa; Yuyama, Masami; and Kurosawa, Kazuyuki, 4,712,243, Cl. 381-43.000.

Yuyama, Yukihiro; Motosugi, Takanori; Honda, Yasuhiro; and Ichikawa, Akira, to Ricoh Company, Ltd. Thermosensitive recording adhesive sheet. 4,711,874, Cl. 503-206.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Schuster, Max, 4,711,332, Cl. 192-48.920.

Zanussi Elettrodomestici S.p.A.: *See*—
Mori, Maurizio; Babuin, Piero; and Cargnel, Giuseppe, 4,711,103, Cl. 68-12.00R.

Zarrineghbal, Hossein; and Quinlan, Charles W., to REI Technologies, Inc. Process for enhancing the cetane number and color of diesel fuel. 4,711,713, Cl. 208-222.000.

Zavy, Michael T.: *See*—
Lindsey, Thomas O.; and Zavy, Michael T., 4,711,897, Cl. 514-665.000.

Zboril, Vaclav G., to Du Pont Canada Inc. Color of polymers. 4,711,923, Cl. 524-323.000.

Zeiringer, Rudolf: *See*—
Stubenberg, Johann; Denk, Heimo; and Zeiringer, Rudolf, 4,711,129, Cl. 73-708.000.

Zemel, Bernard; and Closmann, Philip J., to Shell Oil Company. Steam quality measurement apparatus and method. 4,712,006, Cl. 250-269.000.

Zenith Electronics Corporation: *See*—
Greiner, Siegfried M.; and Palac, Kazimir, 4,712,041, Cl. 313-407.000.
Walker, David L., 4,712,237, Cl. 380-15.000.

Zeroni, Ludwig: *See*—
Pertzsch, Albert; Zeroni, Ludwig; and Brunner, Hubert, 4,712,150, Cl. 360-132.000.

Zielinski, Paul E.: *See*—
Fox, Lester A.; and Zielinski, Paul E., 4,711,066, Cl. 53-436.000.

Zimmerman, Morris: *See*—
Finke, Paul E.; Doherty, James B.; Zimmerman, Morris; Ashe, Bonnie M.; and Dorn, Conrad P., 4,711,886, Cl. 514-195.000.

Zinssmeister, Axel: *See*—
Muller, Richard; Leis, Roland; and Zinssmeister, Axel, 4,711,189, Cl. 112-121.120.

Zitz, Alfred: *See*—
Barnthaler, Franz; Bedenk, Ferdinand; Schetina, Otto; and Zitz, Alfred, 4,711,502, Cl. 299-33.000.

Zucker, Richard S.; and Adinolfi, Philip J., to Westinghouse Electric Corp. Apparatus for storing electronic components. 4,711,351, Cl. 206-331.000.

Zussman, Melvin P.: *See*—
Choyke, Wolfgang J.; Wood, Susan; Scala, Luciano C.; Zussman, Melvin P.; Doggrell, Leslie A.; and Lauer, Janet S., 4,711,822, Cl. 428-458.000.

Zwack, Robert R.: *See*—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,711,917, Cl. 523-400.000.

Zwicker, Eberhard; Beckenbauer, Thomas; and Beer, Guenther, to Siemens Aktiengesellschaft. Directional microphone arrangement. 4,712,244, Cl. 381-68.100.

ZymoGenetics, Inc.: *See*—
Insley, Margaret Y.; and Kawasaki, Glenn, 4,711,848, Cl. 435-91.000.

ZYP Coatings, Inc.: *See*—
Chapman, Lloyd R.; and Holcombe, Cressie E., Jr., 4,711,666, Cl. 106-14.120.

2610 PGA Partnership: *See*—
Franchina, Thomas F.; Gudmundson, Gunnar G.; and Reuss, John R., 4,711,565, Cl. 355-39.000.

501 China Technical Consultants, Inc.: *See*—
Wey, Feng-Feng, 4,711,743, Cl. 260-370.000.

501 Hoechst Aktiengesellschaft: *See*—
Konig, Wolfgang; Engels, Joachim; Uhlmann, Eugen; and Wetekam, Waldemar, 4,711,847, Cl. 435-70.000.

501 Nederlandse Centrale Organisatie Voor Toegepast-Enschappelijk Onderzoek: *See*—
Houpt, Pieter M.; and Wielandt, Ralph T., 4,711,126, Cl. 73-293.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF DECEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bennett, Clifford D.; and Odenthal, Charles. Exhalation valve assembly. Re. 32,553, Cl. 137-271.000.

Chatterton, Robert T., to Northwestern University. Method of determining pregnanediol in female urine and test device for use therein. Re. 32,557, Cl. 435-7.000.

Circuit Chemistry Corporation: *See*—
Czaja, James J., Re. 32,555, Cl. 252-79.300.

Czaja, James J., to Circuit Chemistry Corporation. Solder stripping solution. Re. 32,555, Cl. 252-79.300.

McDonnell Douglas Corporation: *See*—
Murphy, Dennis E., Re. 32,554, Cl. 244-118.500.

Mein, Peter G. Process for recovering cesium from cesium alum. Re. 32,556, Cl. 423-599.000.

Murphy, Dennis E., to McDonnell Douglas Corporation. Vent structure. Re. 32,554, Cl. 244-118.500.

Northwestern University: *See*—
Chatterton, Robert T., Re. 32,557, Cl. 435-7.000.

Odenthal, Charles: *See*—
Bennett, Clifford D.; and Odenthal, Charles, Re. 32,553, Cl. 137-271.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Blissett, Kitson; and Dunbar, Robert A., to Rothenhaus, Robert, a part interest. Control device responsive to infrared radiation. B1 4,346,427, 12-8-87, Cl. 361-173.000.

Chen, Ching H.: *See*—
Chen, Jiann; and Chen, Ching H., B1 4,513,453, Cl. 2-150.000.

Chen, Jiann; and Chen, Ching H. Pre-tied necktie. B1 4,513,453, 12-8-87, Cl. 2-150.000.

Coutinho de Assis, Ruy: *See*—
Valladares Barrocas, Helcio V.; de Castro M. da Silva, Joao B.; and Coutinho de Assis, Ruy, B1 4,232,179, Cl. 585-640.000.

Day, Joseph G., to Johnson Matthey & Co., Limited. Process for the recovery of platinum group metals from refractory ceramic substrates. B1 4,428,768, 12-8-87, Cl. 75-10.190.

de Castro M. da Silva, Joao B.: *See*—
Valladares Barrocas, Helcio V.; de Castro M. da Silva, Joao B.; and Coutinho de Assis, Ruy, B1 4,232,179, Cl. 585-640.000.

Dunbar, Robert A.: *See*—
Blissett, Kitson; and Dunbar, Robert A., B1 4,346,427, Cl. 361-173.000.

Expand-A-Line, Incorporated: *See*—
Thompson, Alan E., B1 4,507,019, Cl. 405-154.000.

Intalite International: *See*—
Taylor, John L., B1 4,034,534, Cl. 52-668.000.

Johnson Matthey & Co., Limited: *See*—
Day, Joseph G., B1 4,428,768, Cl. 75-10.190.

Kelly, John G.: *See*—
Lorenc, Walter F.; Kelly, John G.; and Mandel, Fredrick S., B1 4,457,847, Cl. 210-698.000.

Lorenc, Walter F.; Kelly, John G.; and Mandel, Fredrick S., to Nalco Chemical Company. Carboxylate polymers for internal scale control agents in boiler systems. B1 4,457,847, 12-8-87, Cl. 210-698.000.

Mandel, Fredrick S.: *See*—
Lorenc, Walter F.; Kelly, John G.; and Mandel, Fredrick S., B1 4,457,847, Cl. 210-698.000.

Nalco Chemical Company: *See*—
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Schubeler, Kenneth E.: *See*—
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Sirena S.p.A.: *See*—
Garnerone, Alberto, 293,090, Cl. D10-114.000.

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Brogdon, J. William, 293,114, Cl. D15-1.000.

Thornton, H. Patrick: *See*—
Sherrill, William; Thornton, H. Patrick; and Cole, Brian S., 293,101, Cl. D14-52.000.

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Brown, Wilbert C.; and Tosto, Roger J., 293,088, Cl. D10-106.000.

Tosto, Roger J.: *See*—
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ISSUED DECEMBER 8, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 331

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CLASS 387

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CLASS 401

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CLASS 403

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	624	293,043		99	293,072		424	293,082		52	293,101	D21—	13	293,120	D30—	152	293,139
D3—	30.1	293,044		102	293,063		446	293,083		53	293,102		25	293,121	D32—	18	293,140
	101	293,045			293,064	D10—	34	293,084			293,103		66	293,122		25	293,141
D6—	335	293,047		104	293,065		60	293,085			293,104		187	293,123		38	293,142
	347	293,046			293,066		71	293,086			293,105		198	293,124		46	293,143
	366	293,049		334	293,067		101	293,087		65	293,106		201	293,125		53.1	293,144
	373	293,050		346	293,068		106	293,088		68	293,107		219	293,126		58	293,145
	431	293,052			293,069			293,089		81	293,108	D23—	207	293,128		70	293,146
	484	293,051			293,070		114	293,090		100	293,109		226	293,127			293,147
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	499	293,054	D8—	20	293,074	D12—	110	293,092		102	293,111			293,130		26	293,149
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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